

Railway Engineering Maintenance

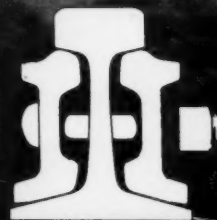
AUGUST, 1942

In good or bad weather—
day or night—
winter or summer

IMPROVED HIPOWERS

IMPROVE TRACK

Their great reserve
spring power preserves
track—cushioning
shocks—equalizing
tensions—protecting
rail ends and joint bars.



NATIONAL LOCK WASHER CO.

A COMPANY OF THE

Reliance HY-CROME Spring Washers



From the **TOP** to the **BOTTOM** in Railroad bolted construction the economic value of **HY-CROME** Spring Washers has been proven.

Maintenance costs can be reduced on Locomotives—Freight and Passenger Cars—Track Joints—Frogs—Cross-overs—Switches—Signals and Special Track Construction and Equipment if **HY-CROME** Spring Washers are used for your fastening problems.

Inquire regarding the special type of **HY-CROME** Spring Washers developed for each specific application and to definite specification.

★ **BUY WAR BONDS AND STAMPS** ★



EATON MANUFACTURING COMPANY

RELIANCE SPRING WASHER DIVISION

MASSILLON, OHIO

Sales Offices: New York, Cleveland, Detroit, Chicago, St. Louis, San Francisco, Montreal

FIGHTING FIRES *before they start*

Most fires are preventable. A smoldering cigarette, flipped carelessly into a dark corner . . . a welder's spark flying unnoticed into a pile of oily waste—these little things can, and do, start devastating fires.

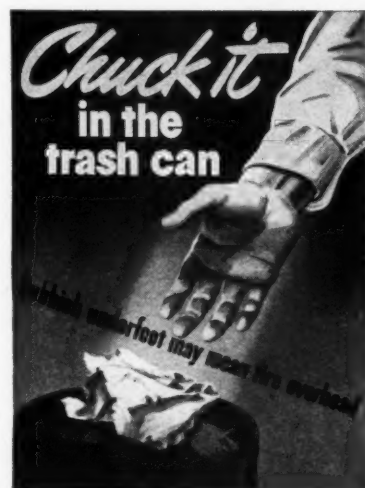
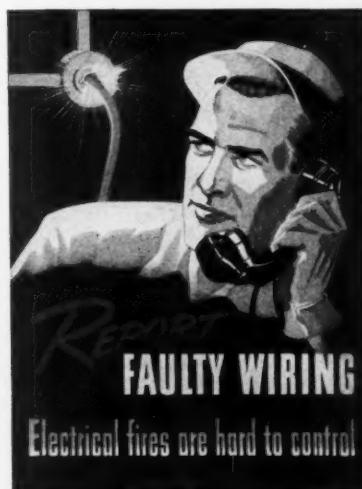
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trained, fully-equipped fire-fighting forces supplied the backbone of the fire-control effort, maintaining day-and-night vigilance in every Bethlehem plant and shipyard.

But to bring home the vital importance of fire prevention and control to every Bethlehem employee, we've designed a series of posters in full color and are displaying them in key locations throughout all Bethlehem

shipyards and steel plants, which are now engaged in vital war work.

These posters are based on analysis of the most serious causes of fire and the all-important part of the human element in fire prevention. By pointing out to employees specific ways in which they can prevent or subdue fires, the posters are helping to minimize a potentially grave threat to the production of war materials.



Five of Bethlehem's series of fire-prevention posters. These posters are printed in full color. Each poster is designed to emphasize a specific problem in fire prevention or control.

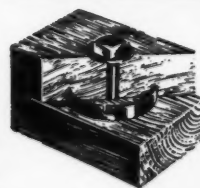


War-production plant executives who are carrying on fire-prevention campaigns may find these posters of interest. A complimentary set will be supplied on request to Bethlehem Steel Company, Bethlehem, Pa.

A BIG HELP TO ARCHITECTS AND ENGINEERS



THIS FREE REFERENCE BOOK shows in detail how designers are taking full advantage of the TECO System of Construction by using timber as a modern engineering material. Available to any architect or engineer who has not already received a copy. Please write on your firm letterhead.



TECO Ring Connectors spread the load on a timber joint over practically the entire cross-section of the wood.

Timber
ENGINEERING COMPANY
WASHINGTON, D. C. PORTLAND, OREGON

★ ★ ★ ★ ★ ★ ★ ★

Ready

**When and Where
You Need 'Em,
Uncle Sam**

**You Can Count On
Woodings-Verona Products
to Help the Victory Program**



As modern as tomorrow, but with the knowledge and experience of seventy years, Woodings-Verona Tool Works specialize in the manufacture of Spring Devices which are safeguarding and protecting thousands of miles of tracks on railroads all over the Nation.



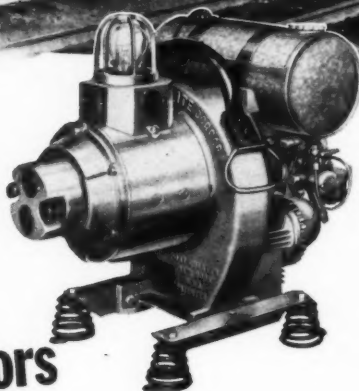
Since 1873

WOODINGS-VERONA TOOL WORKS
VERONA, PA. Offices Principal Cities CHICAGO, ILL.

PAVING THE WAY TO VICTORY



with the help of **HOMELITE** Portable Generators



The railroads have a job on their hands. Troops, munitions, materials, and supplies must move steadily, quickly, and safely. It's a big order. It means roads must be kept open and in good condition. It means that repairs must be made efficiently, rapidly and, in many cases, with a minimum of man power.

Railroads are doing the job well—and in many cases Homelite Portable Generators are helping them do it. Section gangs are using these handy gasoline-engine-driven generators to operate electric hand tools. And with these electric tools they are beating the daylight out of crews that have to work with hand tools. They get their work done faster. Delays are eliminated. Repairs are finished away ahead of schedule.

Homelite Corporation

2108 RIVERDALE AVENUE . . . PORT CHESTER, NEW YORK . . . U. S. A.



Homelites give you electric power in out-of-the-way places where the use of electric tools would be otherwise completely out of the picture.



Homelites can be used to operate electric tools or brilliant floodlights for night work. With Homelites you can speed work both day and night.



Homelites are portable. One man can carry them. They weigh only 83 pounds. They can be put in operation anywhere, and they need no manual attention.



4 years after packing with RMC PLASTIC, joint assemblies are still 100% Corrosion-free!

Saving Thousands of Tons of Rails Yearly!

Saving and conserving rail steel—a most vital Material for Victory—is the BIG Job that RMC PLASTIC is helping the railroads accomplish.

Now, more than ever before, as freight trains grow longer and more frequent, speeds faster and car loadings heavier, rail joints need RMC PLASTIC'S protection against corrosion and kinked and humped track.

One application of RMC PLASTIC pro-

TECTS rail joints for life—provides *complete, permanent* protection against all corrosive agencies. And, RMC PLASTIC also lubricates the joints so thoroughly that the rails cannot "freeze", but are free to expand and contract uniformly.

RMC PLASTIC saves far more than it costs. Its cost is mere pennies for miles of rail. Get RMC PLASTIC protection for your rails TODAY!

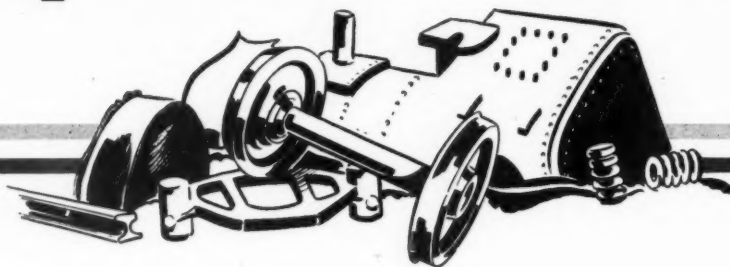
NO HIGH PRIORITIES on RMC PLASTIC

You Can Get *All* You Want, *WHEN* You Want It!

RAILWAY MAINTENANCE CORP.
PITTSBURGH, PENNSYLVANIA



TURN IN ALL YOUR *SCRAP* Help Shorten the War!



Let's face these facts: Waste materials—scrap metals, rubber, and all the rest—are the life-blood of America's war industry. The demand is great, the supply dwindling. Before we can win, *every pound* of these idle materials must be converted into ships, trucks, tanks, and guns. Remember, about one-half ton of steel scrap is needed for every ton of new steel produced.

There may be forgotten tons of scrap in your yards or along your right-of-way. *Put these waste materials to work.* (Steel scrap collected will be purchased by the steel industry at the established government price.)

HERE IS HOW YOU CAN HELP

1. Name a wide-awake salvage committee chairman for each division and department in your organization. Set up a definite, continuous salvage program.

Inspect worn-out or obsolete equipment. If it can be used—fine! If not, why not scrap it?

2. Set a definite clean-up day for *every week*. Collect everything that is not useful.

3. Separate the scrap—ferrous and non-ferrous metals, for example. Then call the scrap dealer.

4. Urge your employees to collect old rubber and discarded metal household equipment and get it to a local salvage committee, charity or junk dealer.

★ ★ ★

The reward is great: American lives saved and a shorter war. It's a job that everyone must share in doing for the duration. The Armco Railroad Sales Co. Inc., 2460 Curtis Street, Middletown, Ohio.

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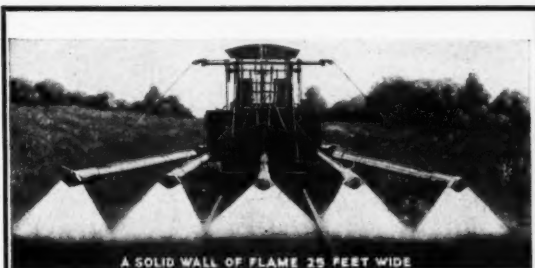
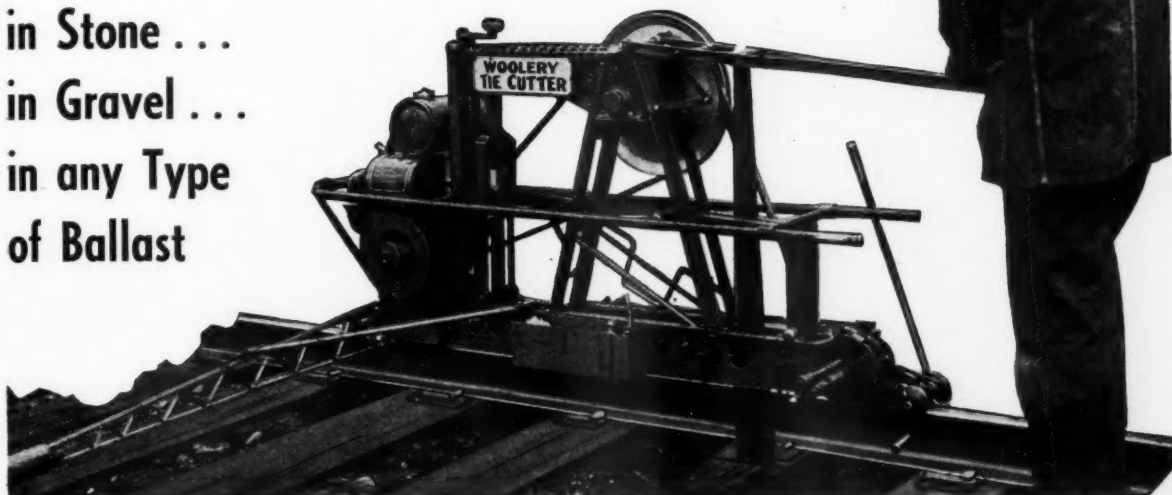


This advertisement is in support of the Salvage Program of the Bureau of Industrial Conservation, the War Production Board.

GET YOUR TIES IN NOW! Despite the Labor Shortage

... Use WOOLERY TIE CUTTERS

in Stone ...
in Gravel ...
in any Type
of Ballast



A SOLID WALL OF FLAME 25 FEET WIDE

WOOLERY WEED BURNERS

For fast, economical maintenance of clean track, all-year round. Models available for every track need. 3- and 5-burner types for main line track; 2-burner type for branch lines and yards; Portable model for use on or off track. Now being used by more than 60 railroads.

With manpower at a premium and more work than ever to be done, it is of vital importance that maximum results be secured from every man available.

The Woolery Tie Cutter provides a simplified method of removing ties from the track without digging or trenching, or disturbing the ballast. Woolery Tie Cutters can be used in any type of ballast—stone, gravel, cinder, etc. The machine quickly cuts the ties into 3 easily-handled pieces, which can be lifted (not pulled) easily from the tie-bed, without disturbing the surface.

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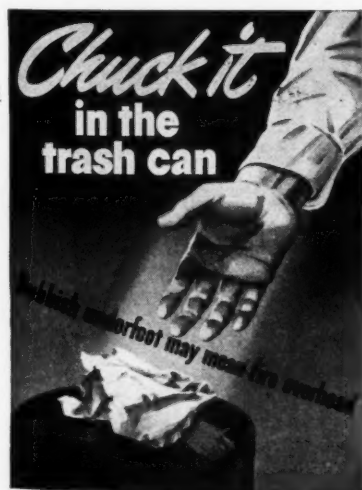
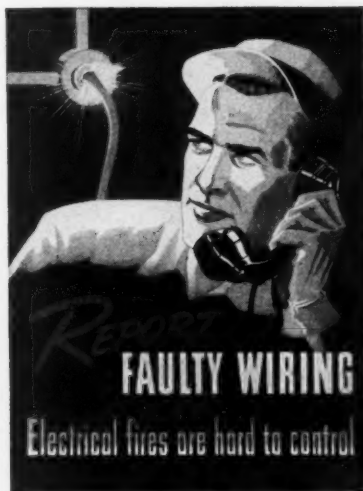
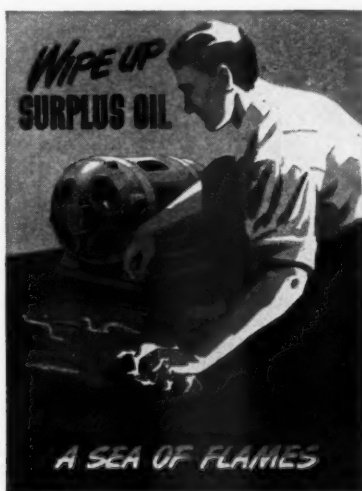
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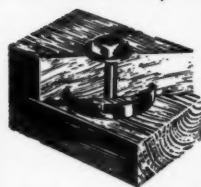


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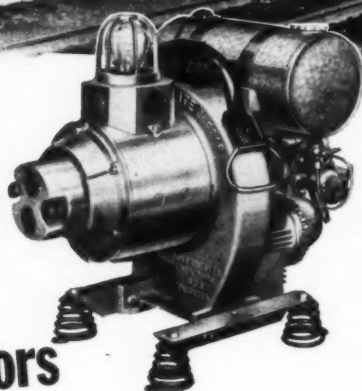
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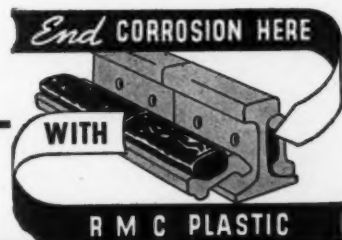
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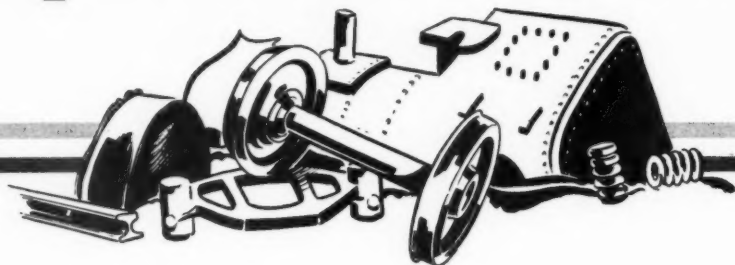
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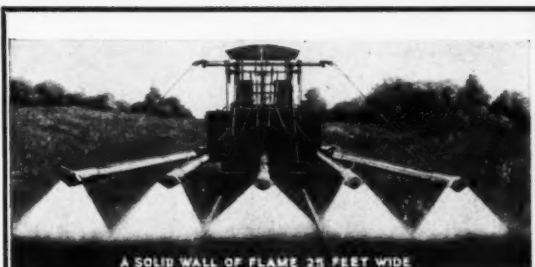
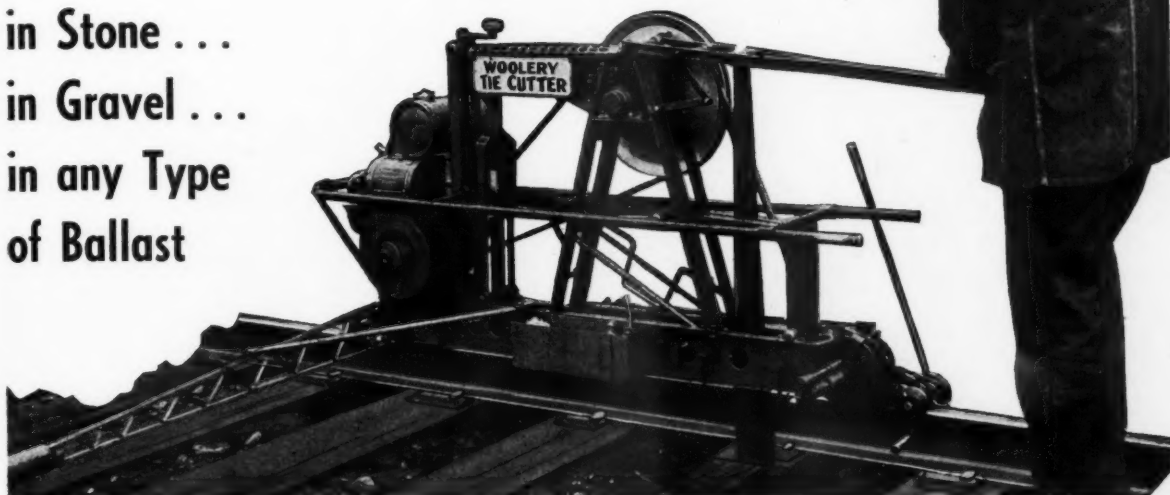


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★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★
THE RAIL JOINT COMPANY, INC.
50 CHURCH STREET NEW YORK, N. Y.

Cars That Carry No Produce

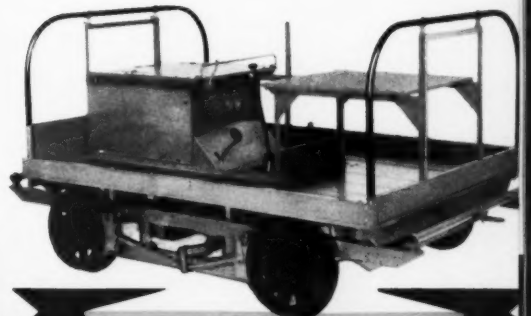
HELP GATHER HARVESTS ALL YEAR

Thanks to modern, fast rail transportation, each season's yield of fruit, vegetables and other perishable produce is now rushed to market in record time. Helping the fast refrigerated freight cars maintain their schedules are dependable Fairmont Railway Motor Cars. By helping signalmen inspect and maintain semaphores and other protective devices—by furnishing dependable transportation for track supervisors, roadmasters and inspectors checking the condition of the roadbed, and in the service of section men, B and B maintenance crews and work gangs repairing the right-of-way—Fairmont Railway Motor Cars make a vital contribution to the safety of both freight and passenger traffic. Fairmont Railway Motors, Inc., Fairmont, Minnesota.

Performance
ON THE JOB
COUNTS

Fairmont

RAILWAY MOTOR CARS



FAIRMONT A5 SERIES C

Three to Eight Men. One to Seven Trailers.
3000 Lb. Load Capacity



FAIRMONT 59 SERIES D car in
signal maintenance work



FAIRMONT M19 SERIES D in track
supervisor's service



FAIRMONT M14 SERIES E for all
light section service



FAIRMONT 52 SERIES E in standard section work

ROADS RUSH TRACK WORK WITH CP WRENCHES



NUT REMOVAL AND APPLICATION SPEEDED WITH CP TOOLS

Fastest Way Proves Also Safest

NEW YORK (CP) — Reports from railroads show rapidly widening use of CP Pneumatic Wrenches (Impact Type) in maintenance-of-way and bridge work. These fast, powerful pneumatic wrenches are so much speedier in the application and removal of nuts, bolts, lag screws, etc., that workers who use them do a better job of track and bridge maintenance in less time and at lower cost. Contributing factors are their light weight, minimum vibration, and ease of handling. Having no torque, they are the safest wrenches obtainable.

Write for a copy of "CP Equipment for Maintenance of Way".

**CHICAGO PNEUMATIC
TOOL COMPANY**

General Offices: 8 E. 44th St., New York, N. Y.

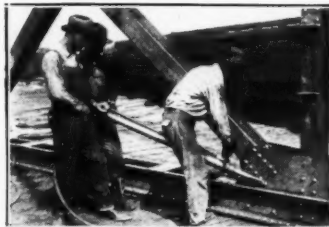
↑ **ASSEMBLING TRACK** sections with Chicago Pneumatic 365-RP Wrench (Impact Type). Fastest, safest way to apply, or remove track nuts. Seven models, for nuts, bolts, lag screws, etc., up to 1 3/4" bolt size. Write for catalog.

FAST WORKING Chicago Pneu-→ matic general-purpose Pneumatic Grinders, fitted with wire brush, quickly clean paint, rust, and scale. Write for latest catalog.



↑ **CP TIE TAMPERS** — low air consumption type — are ideal for "nipping" and small raises, as well as for general tamping jobs where the track is raised several inches. Write today for descriptive catalog.

RIVET BUSTER — This → Boyer Superior Rivet Buster usually needs but 4 to 8 blows to remove heads from rivets up to 1 1/2". For rivets up to 1" No. 11-X (One-Man) Rivet Buster is also available.



CHICAGO



PNEUMATIC

PNEUMATIC TOOLS

ALSO: Air Compressors, Electric Tools, Rock Drills, Hydraulic Aviation Accessories, Diesel Engines

DRILLS
WRENCHES
FLUE ROLLERS
RIVETERS
GRINDERS
CHIPPERS



Oxy-acetylene flame-straightening of joint bars was developed many years ago by a leading railroad with the co-operation of Oxweld Railroad Service. Laboratory investigations of the metallurgical aspects of this development have shown that this application, when done under Oxweld procedures, retains practically the full strength of the joint bar.

OXY-ACETYLENE FLAME-STRAIGHTENING

Conserves Materials and Equipment

• Worn joint bars intensify the effects of rail-end batter and thereby contribute to wear, vibration, and shock on locomotives and cars. To overcome sag or droop in the rail caused by worn joint bars, oxy-acetylene flame-straightening of the bars in track has proved to be an effective and economical method.

In this Oxweld procedure two blowpipes are used to heat simultaneously an area on the base of the joint bars. Then, after the metal cools and contracts, the bars contact the rail at the center fishing surfaces and the rail ends are freed to assume their normal surface. While a flame-straightened joint bar is not the equivalent of a

new bar, it will adequately serve as a rail-supporting member and will thus prolong the useful life of the bars now in track. When used in connection with a program of building up worn rail ends by welding, flame-straightening materially reduces the area and depth of welding required, and thus saves welding rod for other vital uses.

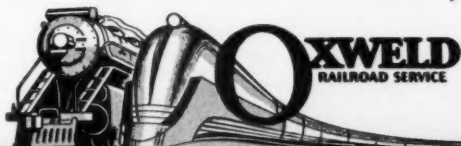
THE OXWELD RAILROAD SERVICE COMPANY

Unit of Union Carbide and Carbon Corporation



Carbide and Carbon Building

Chicago and New York



SINCE 1912—THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS

The word "Oxweld" is a registered trade-mark of a Unit of Union Carbide and Carbon Corporation.

TO EXECUTIVES:

NOW YOU CAN HELP

Even More...

**New Treasury Ruling Permits Purchases
UP TO \$100,000, in any Calendar Year, of
Series F and G WAR BONDS!**



The Treasury's decision to increase the limitations on the F and G Bonds resulted from numerous requests by purchasers who asked the opportunity to put more money into the war program.

This is not a new Bond issue and not a new series of War Bonds. Thousands of individuals, corporations, labor unions, and other organizations have this year already purchased \$50,000 of Series F and G Bonds, the old limit. Under the new regulations, however, these Bond holders will be permitted to make additional purchases of \$50,000 in the remaining months of the year. The new limitation on holdings of \$100,000 in any one calendar year in either Series F or G, or in both series combined, is on the cost price, not on the maturity value.

Series F and G Bonds are intended primarily for larger investors and may be registered in the names of fiduciaries, corporations, labor unions and other groups, as well as in the names of individuals.

The Series F Bond is a 12-year appreciation Bond, issued on a discount basis at 74 percent of maturity value. If held to maturity, 12 years from the date of issue, the Bond draws interest equivalent to 2.53 percent a year; computed on the purchase price, compounded semiannually.

The Series G Bond is a 12-year current income Bond issued at par, and draws interest of 2.5 percent a year, paid semiannually by Treasury check.

Don't delay—your "fighting dollars" are needed *now*. Your bank or post office has full details.



Save With . . .

War Savings Bonds

This space is a contribution to America's All-Out War Program by RAILWAY ENGINEERING AND MAINTENANCE

SAFE

..ANY OF THESE
RIGHT-OF-WAY
MAINTENANCE
METHODS



← TRACTOR-SCRAPER

There's no interference with traffic with this 2-Cycle Diesel tractor and 2-wheel scraper. Picks up load and front or rear-dumps it on the level or back up the slope without even coming near the tracks. Fast, versatile, safe — ideal for long or short hauls!



← TRACTOR-BULLDOZER

Wherever there's building-up work to be done, leveling or removing trees, stumps and boulders, this 2-Cycle Diesel tractor with bulldozer will do the job quicker, safer, at less cost. Working free of the tracks, operator has full control at all times ... easily handles capacity loads with extra hanging-on ability of 2-Cycle engine.



← TRACTOR-SHOVEL

This gas operated Hough Shovel handles the work of a big power shovel at small tractor cost, and without endangering traffic. You can work it alongside the tracks or on the slope while trains pass. Travels, digs, loads ... carries, dumps, spreads! Ideal for cleaning ditches and disposing of material on track bed or slope.

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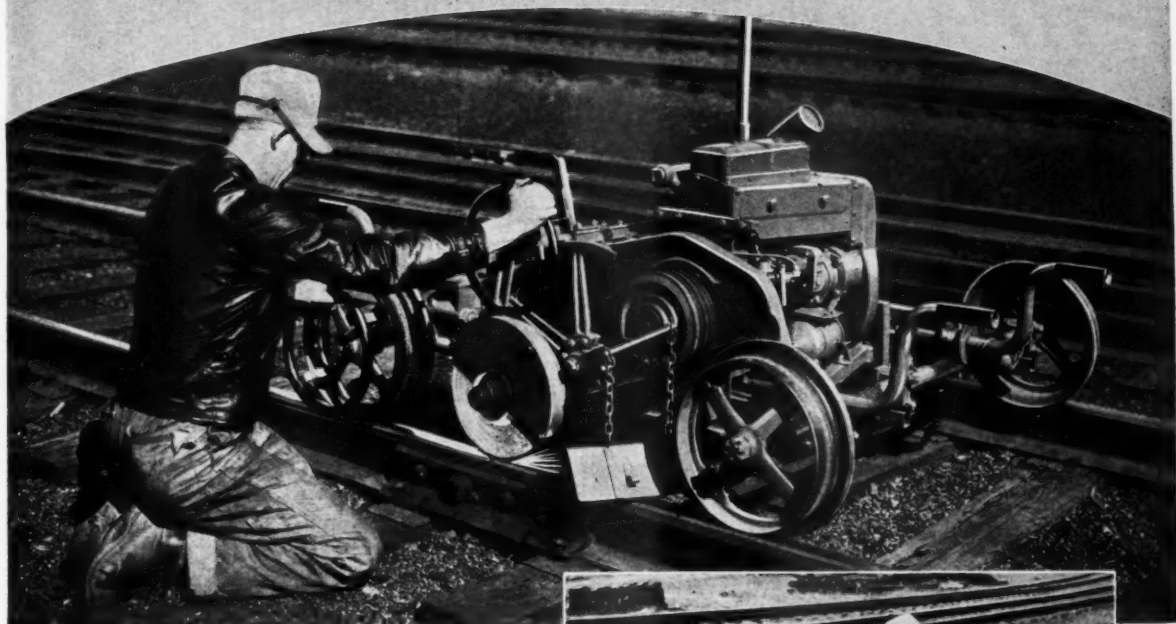
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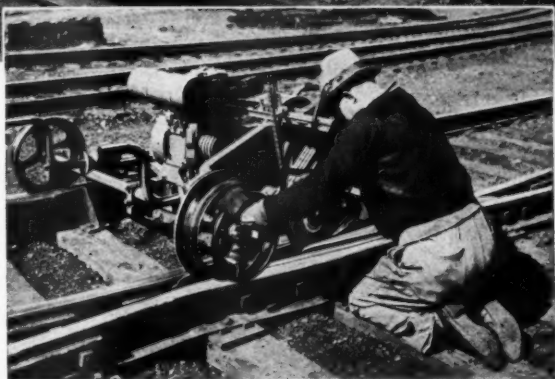
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No. 164 of a series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION

105 WEST ADAMS ST.
CHICAGO, ILL.

Subject: You like our changes

August 1, 1942

Dear Reader:

In our last issue we told you of the changes that we were initiating in typography, arrangement and contents of Railway Engineering and Maintenance to intensify the practical character of the information that we bring to your attention from month to month and to present it in more attractive form. In our letter to you in that issue we invited your reaction to these changes. We appreciate your response; it has come by mail, by phone and personal conversation. And it is evident from your comments that you like the changes.

Quoting from one letter received from the vice-president of a company supplying large quantities of timber products to the railways, "We like it! But Railway Engineering and Maintenance for July deserves much more than brief commendation. The larger white space in the editorial format conveys the impression that I am reading more directly to the subject. Furthermore, an issue that contains an article on track construction by Chief Engineer Hanley of the St. Louis Southwestern, an article on the use of timber-connectors with wood to save steel, and an article on creosote supply, to my mind becomes a 'must' for men in both the railroad industry and the timber-treating industry. I certainly think the July issue merits special commendation to you and to the rest of the Railway Engineering and Maintenance staff."

The chief engineer of one of our most important railways writes, "I like the issue very much. I think that the changes you have made add greatly to the value to and comfort to the reader. I like the new type very much and am sure that the portrait cuts in your News Department are very much of an improvement."

And one of our largest advertisers telephoned his commendation of the changes, stating that they brought to him a sense of freshness in the magazine. "I like the originality of your approach to your problem," he added.

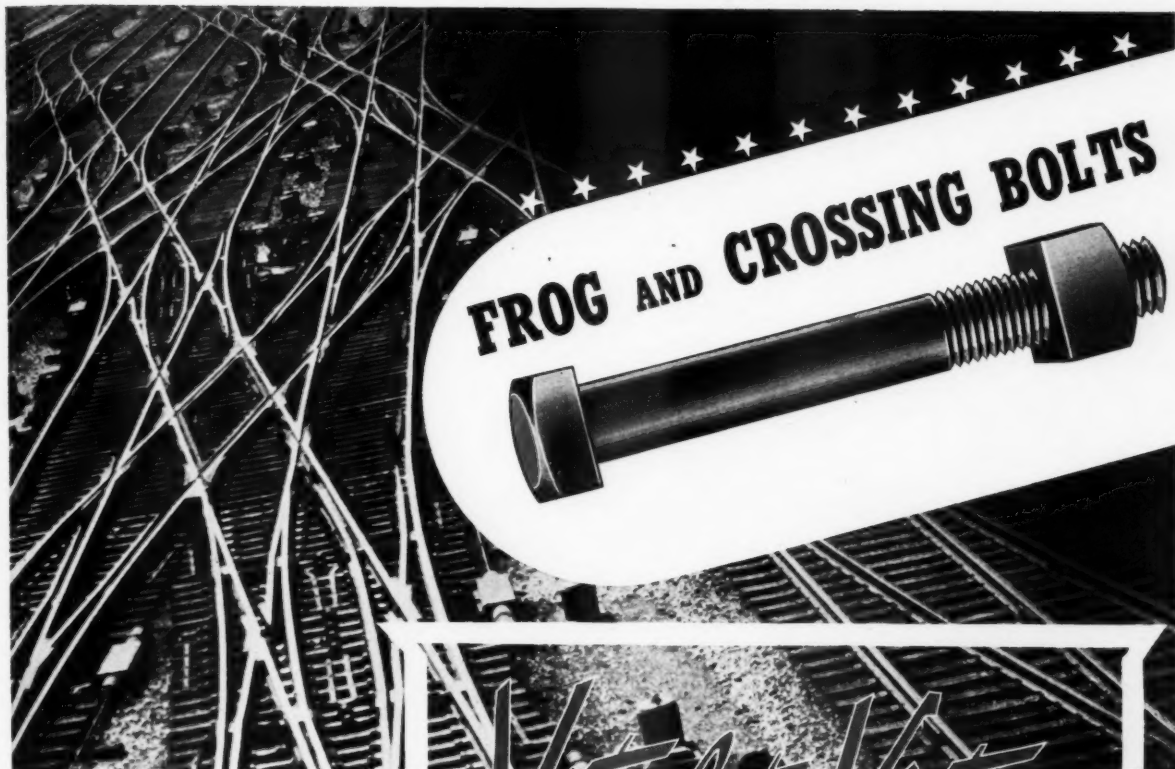
Such have been the comments. They are pleasing to us for they indicate that our efforts meet with your favor. But we are not satisfied. We have other changes in the making. And we invite you to send us your suggestions for still other additions to or improvements in our service, as they occur to you, for we want Railway Engineering and Maintenance to measure up in full to your needs in these strenuous days—in content, in appearance, and in all other respects—and be the magazine that comes first in your reading.

Yours sincerely,

Elmer J. Howson

Editor

ETH:GP



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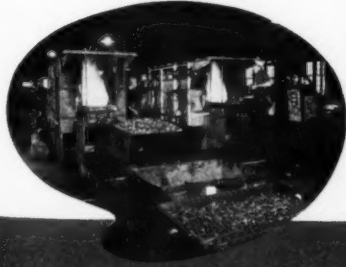


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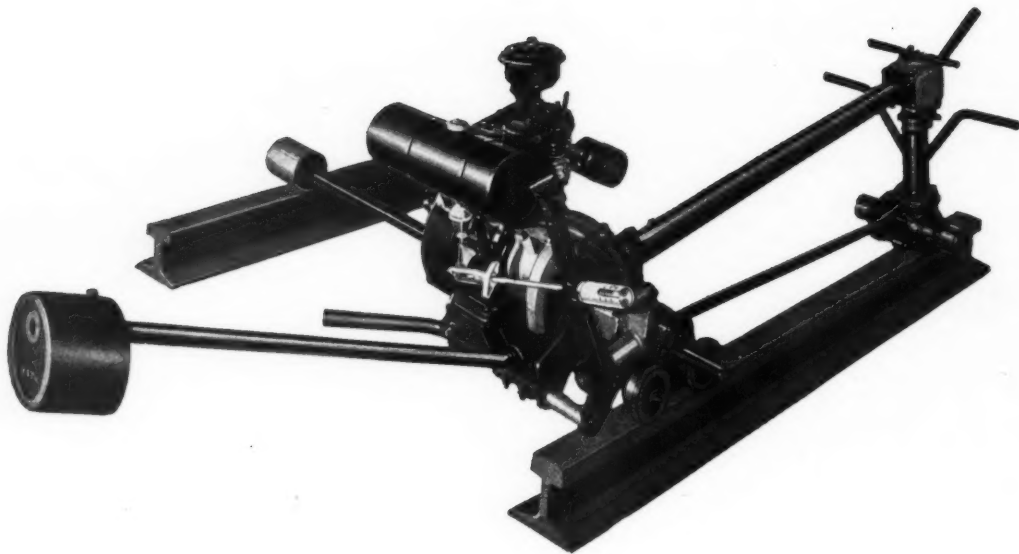


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ELMER T. HOWSON

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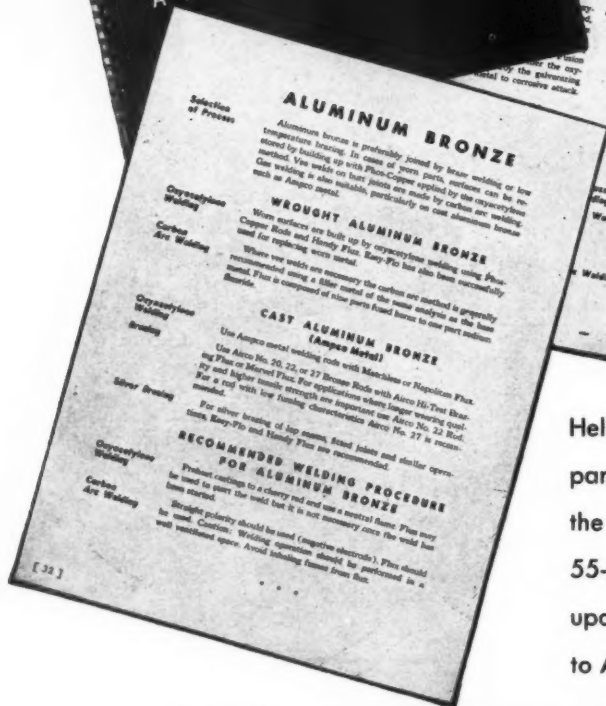
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Railway Engineering and Maintenance

Scrap—

A Pressing War Time Need

Our nation is facing a crisis. We are now engaged in the most gigantic war the world has ever experienced. The demands for materials of war exceed all previous requirements. And among these materials, steel stands at the top of the list.

The steel industry is doing a marvelous job in increasing production. In 1932, in the depth of the depression, the production of steel totaled only 13,681,000 tons. With the gradual recovery in industry at large and then the acceleration in the early stages of the National Defense program, steel production rose to 67,000,000 tons in 1940; last year it increased to a record total of 83,000,000 tons. And this year the demand is 90,000,000 tons—a total equal to the production of all the rest of the world combined.

Scrap Essential in Steel

This tremendous production of steel is essential to the complete functioning of our war effort. But it is not attainable unless we can collect 6,000,000 tons more scrap iron and steel than we have been doing. The shortage of scrap now threatens to limit our production of steel—and the threat is very real, for already some furnaces have been forced to shut down and others are operating on a hand-to-mouth basis. It arises from the fact that the steel industry requires scrap metal and pig iron in about equal proportions for the production of steel. In other words, about half of the steel that goes into every ship, every tank and every gun comes from scrap.

This crisis constitutes a very real challenge to the railways, for they are normally one of the largest sources of scrap. It comprises an equally direct challenge to the maintenance of way department, for it furnishes more than half of the railway scrap. The challenge is to every employee of this department to locate and report every possible pound of scrap.

Sources of Maintenance Scrap

Much of the maintenance of way scrap comes from rails and fastenings that are released by newer sections. Much is also being released by the abandonment of branch lines. Such sources come within the control of railway managements.

But a large amount of scrap metal is to be found also in small quantities all over the railroads. Even the track tools discarded in the weeds, the tie plates and fastenings buried in the shoulder ballast, and the spike stubs left in the ashes when old ties are burned, mount into large tonnages over a system. And hidden, possibly forgotten, piles of reserve materials, unused pipe lines, old boilers and the myriad of other materials to be found on the average road have now become of direct importance to our war effort.

The extent to which such metals are uncovered depends primarily on the alertness of maintenance of way employees. They are on the property constantly and know more intimately than any other persons where these materials are. The possibilities of an aroused staff of employees are demonstrated by the results attained by the employees on the Illinois Central, as described elsewhere in this issue. Employees of other roads can do no less in this time of national emergency.



In the words of Donald Nelson, chairman of the War Production Board, "the collection of every possible pound of scrap is the direct and personal obligation of every railway maintenance of way employee to our boys who are at the front. We may think that our 'little bit' won't help, but this

'little bit,' multiplied by the nearly three hundred thousand maintenance of way employees, can create a flow of scrap sufficient to aid very directly in turning the tide."

The situation is serious. Help is needed now. Every maintenance of way man must do his part.

Safety—

More Important Now Than Ever

IN the light of the unprecedented demands for transportation that are being made on the railways by the nation's war effort at a time when hundreds of their trained officers and employees are being called into military service, necessitating their replacement by untrained men, the question of safety—accident prevention—always a matter of paramount importance on the railways, takes on still greater significance.

Much is being said these days about the scarcity and conservation of critical materials, and necessarily so, and railway men, through care, substitution and reclamation, are making a substantial contribution to the war needs of the country in this regard. Much is also being said about safety and accident prevention, but, with labor becoming as critical in many parts of the country as the most critical of basic war materials, while the accident hazard is increasing with intensified operation and the increasing use of inexperienced men, much more emphasis must be placed on the conservation of labor through safety measures and accident prevention than ever before.

Without fear of contradiction, it can be said that no industry has been more safety conscious than the railway industry. Year after year, the railways have intensified their safety efforts, and year after year, as the result, their safety records have improved to the point where they have received national recognition and acclaim.

In the development of this safety consciousness, and the attainment of the results that have been achieved, no group of railway men has played a more important part than those in the maintenance of way and structures department. However, as the entire country, and the railways in particular, are faced with new and even more critical demands for the conservation of man-hours, maintenance men, and particularly those in a supervisory capacity, face an even more intensive job than ever before. Today, traffic is heavier and faster than ever before, work operations are at a peak not reached since 1929, and work equipment and power tools are being used more widely and intensively than at any previous time. Coupled with this situation, thousands of men have entered the ranks of the maintenance forces who are totally ignorant of the hazards involved in their work.

This combination of circumstances presents a challenge to every experienced employee in every maintenance gang, and especially to every supervisory officer, to see not only that his own personal safety record is

not marred, but also that every new employee is made a "safe" employee in the shortest possible time. To accomplish the desired results requires no startling changes in safety rules and practices, but it does require that every trained maintenance employee take safety even more seriously than in the past, and, by word and example, become a constant instructor of his new fellow workers. Only in this way can the waste of thousands of critically-needed productive man-hours—critical to our war effort—be avoided.

Salvage—

Helps Advance Victory Campaign

TODAY, many classes of materials are so restricted for civilian use that they are all but unobtainable. Despite the essential place that the railways occupy in the war effort and despite the relaxation of priorities that has been made in their behalf, they are experiencing almost as great difficulty in procuring some of the materials they need as if they were wholly in the civilian classification. This situation calls for the utmost conservation of all the materials now on hand that are on the restricted list. It is of equal importance to the war effort, however, that those materials not yet under limitations be conserved with equal care so that labor required for their manufacture will not be diverted from industries essential for military production.

Securing maximum salvage when removing a retired building is an excellent example of conservation that will further the National Victory campaign. It has been an all-too-common practice in the past to stress quick removal rather than maximum salvage, as a result of which most wrecking operations have shown a net loss when done by company forces, compared with a net profit when turned over to a wrecking company. Plumbing and lighting fixtures, radiators, pipe, wire, wire conduit and hardware, every item of which is now under priority restrictions, should be salvaged with care.

Tile, slate, asbestos shingles or galvanized metal should be removed with sufficient care to give the largest return in materials that can be reused. Copper flashing, valleys and gutters can be saved for reuse or sent in as scrap, depending on their condition, while tin has a value far beyond its market price. Inside trim, roof sheathing, siding and sheathing, studs, flooring and joists, all should yield a large amount of material that can be reused if they are taken apart with care. Too often, however, the wrecking of railway buildings has been attended with almost complete loss of these mate-

rials, in contrast with the salvage that wrecking concerns are able to obtain.

During recent years, changes in the flow of traffic and in methods of operation have left most railways with abandoned buildings or with buildings that can be abandoned without detriment to their operations, but which have not been retired because there has been a feeling that they might be wanted again in the future. Where there is assurance that they will not be needed, they should be retired and all materials that can be salvaged should be cared for, both while being recovered and after release. The fact that they have heretofore been considered not to be much value is no reason why they should not now be saved and reused. Materials that do not have to be purchased do not have to be taken from essential military needs, and every item that can be saved and reused represents a step forward in the National Victory campaign.

Ballasting—

Should the Lift Be Light or Heavy?

ALL indications point to a more liberal use of ballast in 1942 than in any year in considerably more than a decade. This is also confirmed by direct statements of many ranking engineering officers. From 1930 to 1937, the application of ballast all but ceased, except in connection with the small amount of new rail being laid, and became almost a negligible percentage of that used formerly.

It is true that far more ballast was cleaned during the depression years than had ever been undertaken before. Obviously, this was beneficial to the track and much ballast was reclaimed that would have been discarded under previous practices. The drainage of the track was improved and, as a result, the maintenance forces were enabled to keep the track in smoother riding condition than would have been possible otherwise. Yet, despite the large volume of ballast that has been applied during the last three years, the average age of all ballast in service is still greater than it was in 1929, a considerable amount of it ranging up to 15 and 18 years.

While track can be reconditioned for a time by cleaning the ballast and making light lifts, this practice cannot be continued indefinitely, for when the periods between ballast renewals are extended the track loses its resiliency, and this can be restored only by making relatively high lifts on new ballast. In addition, there is a need for replacing the old ballast to overcome the tendency of the track to become center-bound and to eliminate the uneven surface that invariably develops on ballast that has become dead, despite repeated light surfacings.

For these reasons, division officers and others responsible for the application of the ballast should give serious study to the amount of raise the track should receive, keeping in mind the desirability of getting the best and most far-reaching results from the volume of material available to them. While it is important that enough ballast be applied in all cases to make the expenditure worth while, all factors considered, it becomes still more important where the application is being made in connection with new rail, for in this case all parts of the track will be replaced, except the ties, and even here

renewals will usually be well above normal. It is desirable, therefore, so to plan the ballast operation as to conserve the life of the new rail and to reduce maintenance efforts for several years. This often demands a greater raise than is required for ordinary out-of-face surfacing.

Unit Costs—

Rise Must Not Be Condoned Lightly

ONE of the most constructive developments in the railway industry during the depression years, second only to the outstanding improvements made in both freight and passenger service, was the constantly increasing efficiency which was evidenced in practically every detail of railway operation and maintenance. Improved service and increased economy were the outstanding goals of the railways during these years.

Within this period, rail-laying costs, for example, were cut more than half on many roads; track surfacing costs, especially as measured in quality and permanence, were greatly lowered; and earth-handling costs in connection with ditching, cut-widening and embankment strengthening underwent constant revisions downward. It is true that this trend was born largely of necessity, with lower net earnings and many other handicaps, but the fact that the depression was more than a club in this regard is seen both in the earnestness with which maintenance men sought constantly to lower unit costs year after year, and in the concern that many of them now show as their unit costs, brought about by increased wages, increased interference from traffic, a growing labor turnover and a shortage of adequate work equipment, are beginning to ease upward, seemingly beyond their control.

No road can break up and reorganize its rail-laying forces several times a year to meet delayed rail deliveries, and employ large numbers of men without track experience to fill out depleted ranks, without increasing costs materially; no track ballasting or resurfacing organization can be delayed in its work by traffic 10 to 25 per cent more this year than in past years without affecting unit costs adversely; and no track gang can be forced to return to hand methods or even to the use of less efficient work equipment, without affecting its efficiency. But all of these things are happening—and entirely beyond the control of the maintenance forces.

If this trend of circumstances continues, and there is no reason to believe that it will not, some of the enviable records of the maintenance forces in the past, built up so painstakingly over the years, are certain to fall. However, it would be a discredit to maintenance men if unit costs should rise higher than is absolutely necessary.

It is true that today, in the interest of winning the war, results come ahead of costs—the job must be done regardless. At the same time, in the interest of the same overall objective—it is no time to waste anything, and increasing unit costs of doing work, no matter how brought about, represent waste somewhere along the line. This fact must not be lost sight of. It is one of the important tasks of the maintenance forces to minimize waste time, waste effort and waste material by every means at their command.



Above.—An Amazing Amount of Rubber in Many Forms Was Uncovered. Right. — Sorting Scrap as It Came in



ORGANIZING a major campaign for the collection of scrap on a railway that had scarcely completed a similar system-wide campaign, might seem at first blush to be a waste of time. Yet this is what the Illinois Central has just done, with the surprising result that greater quantities of scrap and usable materials are now being unearthed than were obtained during the first campaign, which in itself was considered an intensive one.

Although the first campaign, which was started early in 1941 as a contribution to national defense, and which was intensified during July and August of that year, had been highly productive of both scrap and materials that could be reclaimed, it was believed in certain quarters that sufficient further hidden sources of unused and unusable materials remained to warrant a second effort. The first campaign was not organized or supervised centrally, but was carried out separately by divisions and departments in response to an appeal broadcast by means of a circular signed jointly by the vice-presidents in charge of operation, engineering, and purchases and stores. While the response to this appeal was gratifying, it was believed by some of the officers in touch with the collection activities, and this was confirmed by later developments, that in large part only

the visible or obvious sources had been tapped, and that many hidden sources of scrap, as well as usable and reclaimable materials, remained untouched.

Special Committee Formed

With our entry into the war, the importance of redoubling the scrap-collecting effort, as a contribution to the nation's Victory campaign was recognized. To insure the success of this second effort, and to make certain that no possible hidden source of either scrap or unused but usable and reclaimable materials was overlooked, this campaign was carried out under the leadership of a special scrap committee that was appointed for the duration of the war. The membership included W. S. Morehead, general storekeeper, as chairman, and representatives from the bridge, building, signal, water service, roadway equipment, forest-products, locomotive and car departments.

This committee was given almost autocratic authority to make decisions, as well as to give orders where necessary, as to what material should be picked up, except where this involved the retirement of property. In the latter event, it was instructed to make a thorough investigation and to recommend the retirement of structures, facilities or equipment where it believed that this action should be taken.



In operation, the exercise of this authority was found to be entirely unnecessary, although the committee did make many decisions in cases where the division officers doubted their own authority, for, without exception, officers and employees entered spiritedly and without reservation into the effort as soon as the purpose was understood. In this connection, the story is told of a foreman in one of the locomotive shops who was inclined to look upon the presence of the committee as an intrusion, until the purpose of the visit was understood. As soon as it was, he said, "Gentlemen, you are welcome to anything I have—I have two sons and a son-in-law with the forces facing the Japs in the Southwest Pacific." And

Materials for Victory

No. 2 of a Series

As a means for furthering the national war effort and as a direct and specific contribution to the national Victory campaign, as well as to impress employees with the importance of conserving critical materials, the Illinois Central has initiated a scrap-collecting campaign under the jurisdiction of a special system scrap committee. Some of the astonishing results that have already been obtained in the collection of maintenance of way scrap are described in this article, the second one in a series on Materials for Victory, the first of which dealt with the uses of timber connectors to make possible the utilization of wood as an alternate for steel in railway construction.

FOR VICTORY

this spirit has been manifest in every department and on every division.

As soon as the committee was organized, it started out, on February 10, 1942, on a tour of the system, stopping from one to five days en-route to explain the program to local officers and employers and to make a thorough inspection of locomotive, car and work equipment shops, power plants, switching and storage yards, water stations, section tool houses, coal chutes, signal supervisors' headquarters, interlockings, passenger stations and bridge department "graveyards." In all, stops were made at

officer and employee, every effort was made to enlist their interest. As an example of the broad view the committee took of its responsibilities and of the length to which it was willing to go to enlist and hold this interest, although it had been the original intention to report conditions that were discovered and the volume of materials unearthed at each point, this idea was abandoned almost as soon as the committee started to function, when it was realized that fear of criticism was likely to impede full and sincere co-operation on the part of both departments and individuals.



Left.—Worn-Out Switches, Frogs and Crossings That Could Not Be Reclaimed Went to the Scrap Pile. Below.—The Right of Way Yielded Fence Wire, Metal Sheets and a Variety of Other Scrap.—"Graveyard" at Markham in Background

It will be noted that the membership of the committee, as it has been given, included representatives from each of the material-handling or consuming departments except track. It was believed that, owing to its wide distribution, track and roadway scrap could be handled better by the local division committees under the supervision of the general committee. A policy that was adhered to steadily was for the committee, including the local division members, to keep together while making inspections, except where subcommittees were sent

40 principal points by the whole committee, and numerous other places were visited by motor car or automobile by subcommittees, or, in some cases, by the entire membership. All divisions had been informed of the general program, and the date of expected arrival was sent to the superintendent several days in advance, so that arrangements would be completed for organizing and setting the drive in motion locally upon the arrival of the committee at each point. The superintendent, the division engineer, the master mechanic and all supervisory officers accompanied the committee while on the division.

Recognizing that the success of the drive depended in large measure on complete co-operation from every



to outlying points. An important advantage of this policy was that all members had equal knowledge of every transaction, while the widely varied experience represented was of high value in forming judgment in the many different situations that were always arising.

At every point visited the division committee, consisting of the supervisors from all departments, joined with the general committee, and the intimate knowledge they possessed of the various premises was of real help in the search that was conducted. As had been expected, most, but not all, of the visible scrap, except that which was being made currently, had been cleaned up during the 1941 campaign. For this reason, the committee directed its efforts largely to discovering hidden accumulations of scrap and usable materials, such as trash dumps at shops, abandoned pipe lines, unused equipment and fixtures in occupied as well as in unoccupied

were discarded. On the other hand, reclaimable materials and scrap, including pipe, journal boxes, couplers, brasses and miscellaneous items of iron, steel, brass and aluminum were found in quantities that more than offset the cost of their recovery.

What had been assumed to be one of the least likely sources of recoverable materials and scrap was the right of way away from terminals. However, a fence-to-fence search, including station grounds, by the section forces, armed with hoes and rakes, more than repaid its cost. Spikes and spike stubs were recovered where old ties had been burned. Tie plates, track bolts, spikes, anti-creepers, occasional joint bars and bolts and parts from cars were found on the shoulders and slopes of the roadbed, while a considerable number of hoes and slash bars from locomotives were recovered. Bundles of old fence wire were taken to the scrap pile, and places where outsiders had dumped

came as intent on unearthing scrap and recovering reclaimable and surplus materials and tools as the general committee.

Buildings also proved to be a source of metal far beyond original expectations. A considerable number of buildings had been abandoned, mostly during the depression, but retained, in expectation that they would be needed again. In other cases, the manner in which they are now being used differs materially from their original purpose, and in this way also large quantities of equipment and fittings were recovered and classified as obsolete, usable, reclaimable or scrap. The items recovered in these ways included gas, water and heating pipes, plumbing fixtures and fittings, copper wire, hardware and various other items.

Some Odd Finds

Several examples of obsolete equipment that yielded unexpectedly large returns in scrap, which were discovered accidentally by members of the committee are worthy of mention. In one case, one of them stubbed his toe on an object projecting from the floor of a blacksmith shop. Investigation brought to light the base and anvil face of an ancient steam hammer. This find added seven tons to the scrap pile. No officer or employee at this shop had any knowledge of the presence of this large block of metal or recollection of the equipment of which it had been a part.

Every member of the committee was provided with a bar having a hook at one end, which he could use to explore trash dumps or other suspicious areas. One of them, noticing a peculiar linear hump in the floor of another blacksmith shop, used his hook to unearth a "striking plate" or community anvil, a type that was not uncommon a half century ago when from 6 to 20 blacksmiths were employed in a single shop. In much the same way several heavier "up-setting blocks" of equally ancient vintage were discovered. These "blocks" were 4½ to 8 ft. square and ranged from 3 to 9 in. thick. None of the present force knew of their presence and only one or two of the oldest employees had even seen one.

Old turntables yielded parts that could be used to replace worn parts on others still in service, and these are being held for emergency use. In one case a gallery for the inspection of truck and end bearings disgorged 1,500 lbs. of gears, bearing parts, etc. Several driving-wheel turntables at wheel lathes, each yielding about 2,000 lb. of scrap, were retired, since driving wheels are now handed to the lathes by overhead cranes.



Worn and Damaged Fire Hose, Formerly Unmarketable, Swelled the Total of Rubber Products That Could Be Salvaged

buildings, rail and fastenings in tracks no longer in service, unused water station equipment, unnecessary stocks of tools and repair parts, scrap and reclaimable materials from unserviceable work equipment, scattered scrap on the right of way and unusable materials which were of no value when discarded.

Trash Dumps Were Mined

Trash dumps at shops and engine terminals yielded the largest amount of scrap, as well as amazing quantities of usable material of all descriptions. In all but a few cases these dumps represented accumulations of years and required considerable labor to perform the mining operations that were necessary to explore them. Substantially all of them also contained appreciable quantities of galvanized sheets, wire, cables, banding strips, rubber hose, dry cells and other items that were of no further use and for which there was no market when they

trash yielded tin cans, metal roofing, siding and other sheets, automobile bodies and many other items for which there is now a market. An example of the odd items recovered was the discarded hub of a ship's propeller, which weighed five tons.

No Facility Overlooked

Section tool houses, water stations and outfit cars used by bridge, building, paint, water-service and track gangs were examined for unusual quantities of tools and for stocks of materials beyond reasonable needs. Except where these facilities and outfits were located at or near terminals, this phase of the investigation was generally in the hands of the local committees, and to their credit, they were able to overcome the generally-recognized reluctance to let go of materials and tools that are hard to obtain and which they are convinced they may need sometime in the future. It is a remarkable fact that they be-

Several items of shop equipment came to light, which, although not in use, had been saved for so long that no one knew their purpose. These were sent to the scrap pile. Machine parts, buckets, gates, aprons and structural material for coaling stations; buckets, structural members and castings at cinder pits; as well as many miscellaneous items from other facilities; both usable and scrap were recovered at these facilities. While the amount was relatively small at each point, the aggregate for the system was surprisingly large.

At Stuyvestant docks, New Orleans, La., an extensive sprinkler system had been dismantled, yielding a very large amount of usable pipe, which had been installed when this facility was used for handling merchandise. While this pipe had been well cared for, it was being held for division use by the division that had salvaged it. The committee turned it into the general store stock, making it available for use at any point on the system.

An example of a large-scale retirement recommended by the committee and approved by the management, was at Dubuque, Iowa, where a refrigerating plant had been discontinued. For several years the boiler plant had been continued in service to heat the passenger station and lay-over coaches and sleeping cars, but as this had recently been replaced by a low-pressure heating plant, the boiler equipment was included in the retirement. Another large facility retired consisted of a fertilizer warehouse, including machinery for unloading ships and handling the fertilizer, a commodity that no longer comes to this port.

Odd Finds in Buildings

Strangely enough, the attics of old passenger stations disgorged the most astonishing range of items, many of which had no connection whatever with the construction or maintenance of the buildings or with their use, including track tools, carpenter's and machinist's tools and a great variety of materials, not a few of which were equally inappropriate. For instance, in one station, parts for a machine tool were discovered, the value of which was appraised at several hundred dollars, of a design not in use on that division, but which fitted and were used to return to service a machine that was badly needed at a shop several hundred miles distant. Neither the agent nor any of the station employees at this point had any knowledge of this cache or how it got there.

For a number of years second-

hand structural steel from bridges has been concentrated in an assigned area at Markham yard—Chicago switching terminal for I. C. lines to the south—and carried as part of the stores department stock. A list of this material has been kept on hand constantly by the bridge department as a guide to determining when and where the material can be adapted for further use. However, after the

retirement be prepared, and many of these have already been approved and the rail and fastenings have been removed. Where any doubt existed with respect to a possible future need for a track, the matter was called to the attention of the proper officers and the investigations that followed have resulted in the retirement of most of these tracks.

For many years the signal depart-

Wrought and Steel Pipe of Every Description Was Obtained from Buildings, Cars, Power Plants, Water Service and Air Lines



committee had visited this "graveyard", it instructed that a new list of the material involved be prepared. This was then submitted to the bridge engineer, and as a result a number of items on the list were turned over as scrap.

As an additional result of this scrutiny, several of the stored spans have been utilized to replace weaker spans on branch lines and the spans thus released have been consigned to scrap. In addition to this action, the committee discovered out on the line a 10ft. I-beam span, a number of I-beams that had been used as falsework and not shipped in when released, an old pile drop hammer, approximately a ton of worn wire rope, about 800 ft. of lidgerwood steel cable and a set of steam hammer leads that had been burned and twisted until they could no longer be used, while a steam-hammer base was rescued for further service. Other finds included both girder and I-beam spans on abandoned tracks and on unused industry tracks. In these cases the committee set in motion the machinery for retiring the facilities and retrieving the materials.

Numerous abandoned tracks, ranging from passing sidings, yard tracks and storage tracks to industrial tracks, were investigated by the committee. Some of them had not been used for years and in most cases they were disconnected at the turnout, but they had never been retired. Where there was no likelihood that they would ever be utilized again, the committee instructed that applications for re-

ment has maintained a repair and reclamation shop at Burnside (95th street, Chicago) where old signal material is worked over and made serviceable. During these years, signal supervisors have had standing instructions to ship all released material to this shop as soon as it has been replaced. Likewise, as scrap has been created in the operation of the shop, it has been turned over to the stores department at regular intervals. Because of these arrangements, little signal scrap was found out on the line or at signal supervisors headquarters.

On the other hand, the same situation with respect to surplus materials was unearthed as in other departments. It is of interest in this connection that several instances occurred in which materials that were badly needed at other points on the line were discovered in places where there was no immediate use for them. In fact, in several cases, materials were found which could not be used on the division that was holding them, but could be put into immediate service on some other division.

Abandoned Pipe Recovered

Information was sought from the older employees and pensioners concerning the site of abandoned water stations and several were thus located where pipe could be recovered from underground lines. In some instances former employers were able to give valuable information with respect to other pipe lines that could

be salvaged. Data were also obtained covering abandoned underground lines at terminals. In the cases under immediate discussion, the pipe was not salvaged when the facilities were abandoned because the cost of recovery would have been more than the value of the pipe. Today, the cost of recovery may be negligible where the pipe can be used to fill an urgent need. In any event, the management takes the position that it has a patriotic duty to perform and is thus obligated to salvage the pipe, whether it is scrap or fit for reuse, and whether it be done at a loss or a profit. For these reasons, arrangements have been made or are under way to recover a large amount of pipe from these abandoned underground lines. As an example of hidden supplies that turned up in unexpected places, the lifting of a manhole cover which gave access to a steam tunnel, disclosed a surprising collection of reclaimable valves and pipe fittings in a wide range of sizes.

Obsolete Units Retired

The Illinois Central maintains 10 division shops for repairing work equipment. While the trash dumps at these shops are not so extensive or of such long standing as those at the locomotive and car shops, the experience with respect to recovery of scrap and usable material differed

and recommended for retirement by the committee were a ballast drainage car, and air-operated rail loader, more than 100 heavy section motor cars, 5 track mowers and a half-swing crane. Requisitions for the retirement of these and other smaller units were put through, and all usable material has been salvaged from them and the remainder turned in as scrap.

Taking nothing for granted, the committee even went through record storage rooms all over the system and instructed that old records which were not of legal or historical value and which are not required by law to be kept, and some of which went back to the original construction of the road 90 years ago, be cleared out. As a result of these investigations many tons of paper were sold, and some of the storage spaces yielded as many as three to five old typewriters, which are being salvaged. Oddly enough, some of them also yielded broken rails, broken car axles and other defective materials that had been held for legal reasons, but forgotten after the need for holding them had passed.

In general, the committee deferred to the representatives of the several departments in making decisions as to what materials were usable and what were unserviceable. Where there was a surplus of usable material beyond any probable or reasonable

As the cars are received, their contents are examined and the items that can be salvaged for further use are sorted out and put away for more careful inspection. Items that are clearly scrap are graded for sale in the usual way.

How Much Was Found

How much scrap and what volume of usable materials were found during the drive? There is no way in which this can be determined accurately, because, as has been explained, by deliberate intent no record has been kept which would enable one to discriminate between what has been unearthed from hidden sources and what would have come in in routine procedure. Furthermore, the campaign is still on and shipments from the many sources unearthed by the committee are still coming in. However, during the three years, 1939, 1940 and 1941, the Illinois Central collected and sold more than 330,000 tons of iron and steel scrap and more than 7,500 tons of non-ferrous scrap, an annual average of more than 110,000 tons and 2,500 tons, respectively, although there was a sharp increase in the shipments during 1941, compared with either 1939 or 1940.

In other words, the campaign carried out in 1941 greatly stimulated the shipment of scrap during all months of the first half of the year, with still further increases during the third quarter. However, during the first three months of 1942 there was an increase of approximately 25 per cent in scrap shipments, compared with the corresponding quarter of 1941, and this was further increased to 35 per cent during the second quarter. Whether this ratio will hold good for the third quarter remains to be seen, although present indications are that the receipts during July will be greater than for the same month last year. It should be understood that these figures cover scrap only and do not include usable material that has been left under the control of the department for which it was originally intended.

The management is more than pleased with the results that have been attained with respect to the volume of scrap materials that have been unearthed from hidden sources, and the serviceable tools and materials that have been returned to channels that will insure their use as needed. Beyond this, however, the officers of the road are convinced that supervisory and other employees have been impressed so deeply with the importance of keeping scrap moving, and so deeply interested in the conservation of tools and materials that



Shipments of Road Department Scrap Also Contained Usable Engineering Materials and Miscellaneous Items from Other Departments

little from that at the mechanical-department shops, except in the amounts recovered. This recovery included copper, brass, aluminum, gray-iron castings and steel.

Except for the trash dumps, this department, of itself, yielded little recoverable material. However, most of the divisions had power machines and tools that were worn out or that had fallen into the disuse by reason of obsolescence, but which had not been retired. Among the larger items ex-

needs, it was ordered to the storehouse, where requisitions from other divisions can be filled, thus reducing the volume of materials to be purchased. This has been and is of real benefit, not only to the railway but to the national war effort as well, for all of the items under consideration represent critical materials in some form.

Likewise, the scrap is sent to the nearest scrap yard, several of which are operated by the stores department.

the effect of the campaign will be felt for a long time to come. Moreover, it is intended that there shall be no let-down in this interest, in

furtherance of which the campaign is to be continued until the close of the war, under the direct and active supervision of the committee.

Preventing Track Damage Due to Locomotive Blowoffs*

WHEN chemically-treated water is used regularly in locomotive boilers, it is necessary to provide for regular blowoffs, as the dissolved solids in the boiler will otherwise soon reach a concentration so great that proper steaming will not be possible. Formerly, engines were equipped with small blowoff cocks on each side of the fire box, discharging directly outward. These were inaccessible, could not be operated from the cab, and could only be used when engines were standing. Attempts were made to extend the control of these blowoff cocks to the cab, and later additional blowoff cocks were located in the back corners of the fire box, with a discharge pipe to an outlet under the cab between the rails. These blowoff cocks were provided with a control in the cab so that they could be handled by the engineman.

Many variations of manually-operated blowoffs discharging perpendicularly onto the track, both between and outside the rails, have been used. The damage resulting to the ballast and roadbed because of the use of blowoffs of this type has been such that the outlet apparatus has had to be so changed that the discharge is made in a horizontal plane parallel with, or at a very slight angle to, the track, toward the rear of the engine. Even this type has had to be equipped with a muffler on the outlet for reducing the velocity of the discharge to prevent damage to the ballast and roadbed.

Other Developments

The next development was the continuous blowoff, consisting primarily of a discharge line from the boiler, which is fitted with a small orifice that restricts the discharge to the volume necessary to keep the boiler water below the foaming point. This type of blowoff is opened

manually when the locomotive leaves a terminal on its run, and remains open until the run is completed, when it must be closed manually. A variation of this type is the automatic continuous blowoff, with no manual control. This is a patented device which functions when the throttle is open and closes automatically when the throttle is closed.

While it is quite a step from the old side blowoff cocks to some of the automatic continuous blowoff equipment, it has been recognized that the discharge of high-pressure steam and water directly onto the roadbed is injurious and dangerous to the track. Therefore, devices have been developed to dissipate the force of the steam and water before it reaches the track or ballast, and such devices are now generally used in connection with blowing on the road. The most successful of these seems to be a muffler type using the principle of centrifugal force. The muffler is cylindrical in shape, and connections from the boiler are made in such a manner that the discharge circulates rapidly in the muffler, throwing the water and sludge to the outside walls, where it drops to the track. At the same time the steam escapes through the center of the top of the muffler into the atmosphere.

Problem at Terminals

The problem of blowing off at terminals is more serious, as the practice of blowing locomotives at a given location results in the deposition of large quantities of sludge, causes the fouling of the ballast and the erosion of the roadbed, and presents serious difficulties during freezing weather. The automatic blowing of switch engines that work regularly on the same lead produces similar results. To overcome these difficulties many railroads have installed special arrangements in terminals. One road reports the use of a timber blowoff pit in the track, with a grille-like cover, which has

proved effective in taking care of water and sludge, particularly during cold weather.

Other roads using side blowoff cocks have constructed wooden blowoff boxes adjacent to the track at designated points. To use one of these, the locomotive is spotted with the blowoff cock immediately opposite an opening that is provided in the box to receive the discharge. Baffles in the boxes cause the solid matter and water to drop to the bottom, from where it is carried off through drain pipes, while the steam escapes through the top. A more elaborate arrangement consists of a blowoff tank, about four feet in diameter and four feet high, buried in the ground, which is so equipped with suitable fittings that the blowoff valve on the engine can be connected to it at such an angle that the circular motion is set up in the tank. This causes the steam to concentrate in the center of the tank, from which it escapes vertically upward through a vent pipe, while the heavier water and sludge, being thrown against the wall of the cylindrical tank, drop to the bottom, where proper sewer connections are provided to carry them away. In some terminals arrangements are made to connect blowoff cocks on engines directly to the blowoff facilities at the roundhouse, the discharge being carried to the washout plant.

Conclusions

(1) The blowing of locomotive boilers, either automatically or manually, while in motion on open track has no appreciable effect on track maintenance, provided that engines are equipped with an efficient muffler or dissipating apparatus to prevent the concentration of the discharge directly at the track structure.

(2) The regular blowing of locomotive boilers at specified points in yards and terminals will increase the cost of track maintenance unless provision is made for removing the water and solid matter promptly from the track and roadbed.

(3) Where switch engines equipped with automatic continuous blowoff devices are operated frequently over the same tracks, it is necessary to incur extraordinary labor expense in removing the discharged sediment from the track, as it soon builds up against the rail and interferes with operation. Such conditions can be particularly expensive on switching leads, especially in cold weather when the discharged water and sludge may freeze and cause considerable difficulty in maintaining switches properly.

*Abstract of a report presented at the convention of the American Railway Engineering Association by a subcommittee of the Committee on Roadway and Ballast, of which H. E. Tyrrell, chief engineer maintenance of way and structures of the Central Lines of the Southern, was chairman.



Hundreds of Engineer Battalion Troops Were Employed in the Construction of the New Military Line

To Train Track and Bridge

This article tells briefly of the construction of the military railroad just completed by the 711th Engineer Battalion, Railway Operating, between Camps Claiborne and Polk, in Louisiana, where thousands of railway troops will receive training in all phases of railway operation and maintenance. It also tells of the track and bridge organizations to be employed on the new line, and army ratings given the officers and enlisted men in these organizations

DOWN in Louisiana on July 11, the 711th Engineer Battalion, Railway Operating, the first battalion of its kind ever to be organized in the United States Army, completed the first army-built, strictly military railroad in the history of the country. The new road, which extends between Camps Claiborne and Polk, two of the large military encampments of the country, is significant not alone because it was built by military personnel, most of whom were former officers and employees of many of the Class I roads of the country, but also because it will be used as a training and proving grounds for hundreds, and possibly thousands, of men in military railway service, including those charged with track and bridge and building maintenance, who, with thousands of others undergoing similar training about the country, will bear the brunt of maintaining rail communications with the American fighting forces wherever they may go.

The new line, known as the Claiborne & Polk Military Railway, is single track throughout, about 50 miles in length, and extends in a general east and west direction, with Camp Claiborne at its east end and Camp Polk at its west end. Not intended as a heavy-duty trunk line, but

rather, primarily as a training grounds for military men in railway operation and maintenance, the new line was built to standards adequate only to its essential purpose, although substantial in every respect. Speed was also a factor in the construction of the line, affecting immediate standards, every consideration being given to completing and putting it into service at the earliest possible date—leaving many refinements to be made following the establishing of through train operation.

Relatively Light Construction

Traversing generally rolling low-lying country, the line has an undulating grade line with a ruling grade of two per cent in each direction, and, except for five curves of 6 deg. to meet special conditions, has maximum curvature of 4 deg. To minimize grading and speed construction, and, mindful of military regulations which will restrict train operation to 30 to 35 m.p.h., the line, in general, was laid out following the contours of the ground as much as possible. As a result, fills, with few exceptions, have a maximum height of about 20 ft., while only a few cuts are deeper than 15 ft. Likewise, bridge openings were

minimized in number and size, pipe culverts often sufficing in the higher ground, where trestles might have been required otherwise, and total grading was kept to approximately 600,000 cu. yd. Final standards for the line call for a subgrade width of 16 ft. on fills and 20 ft. in cuts, with $1\frac{1}{2}$ to 1 side slopes in both cases, but since these standards were sacrificed at many points during construc-



Second-Hand Rail and Turnouts of 75- and 80-Lb. Material Were Used Throughout in the Construction. Fastenings Were New

Maintenance Troops

On New Army Railroad

tion in the interest of speed, the work of building to them will form a part of the work of the military track forces in the months ahead.

Track construction on the line consists of 75- and 80-lb. second-hand rail throughout, second-hand No. 8 turnouts for the most part, and second-hand 4-hole angle bars. All bolts, spikes and spring washers used were new. The ties are of a wide variety of woods, generally 6 in. by 8 in. by 8, or 8¼ ft., and about 60 per cent are treated with creosote, the remaining 40 per cent being untreated. About 75 per cent of the ties, including all of those on curves, are equipped with second-hand tie plates. Ballast throughout is of pit-run gravel, including about 40 per cent sand, the ultimate aim being to place from 6 to 8 in. beneath the ties.

Many Difficulties Encountered

Many difficulties were encountered in building the new line, these arising primarily out of an early shortage of equipment to carry out the work, particularly the grading; highly un-

favorable weather conditions, which included an unusually long and wet rainy season; and the general character of the soil encountered, largely of clay and gumbo, with high ground water through many areas. In this latter regard, at many points, the natural ground was so soft that, to sustain fills, it was necessary to lay solid log mats over the ground surface. At other points, large logs, laid end to end along the sides of the embankments, were used to confine deep embankment footings of coarse sand brought in for the purpose. At still other points, timber cribbing was the only practicable recourse to get across low-lying soft spots.

There are a total of 25 bridges on the line, all of which are of creosoted

timber construction, with open-decks employing 7-in. by 9-in. ties. These bridges, designed for Cooper's E-50 loading, mark an outstanding phase of the new line construction, not because of their number or size, but rather because of the generally high standards to which they were built, in spite of the fact that the majority of the troops employed in their construction had little or no prior experience in bridge or heavy timber work.

The longest bridge on the line is a frame-bent structure, 2126 ft. long, with a maximum height of 15 ft., the bents resting on the cut-off piles of an old bridge formerly on this location. The second largest bridge is a pile structure 785-ft. long, with a maximum height of about 20 ft.,



Building the High Crossing of the Gulf & Red River Railroad, Near the East End of the Line—The Highest of the 25 Bridges Constructed



The Thousands of Troops at Camps Claiborne and Polk Are Already Using the Line in Their Military Activities, as Is Seen in the Above Photograph



The 785-Ft. Pile Trestle Over Spring Creek Is One of the Outstanding Bridges on the New Road. Pile Driver Shown Was Rented from the Missouri Pacific



Until Suitable Earth-Moving Equipment Arrived, Much of the Grading Was Done by Hand Methods

while the third largest bridge is 130 ft. long and includes a 32-ft. second-hand deck girder span.

Culverts on the line are largely of corrugated iron and steel pipe, in sizes up to 60 in. and in multiple runs where necessary. All pipe more than 36 in. in diameter was strutted during construction and was carefully back-filled.

Maintenance Forces

Like its construction, the operation and maintenance of the Claiborne & Polk Military Railway is being handled by the 711th Engineer Battalion, with an organization similar to that in effect on the individual operating divisions of many Class I railroads. Heading up the organization is the commanding officer of the battalion, a lieutenant colonel, who is superintendent of the line. Under him are four companies which handle all phases of the railway's operation and maintenance. Company A, as it is known, is in charge of all maintenance of way and structures work, and is headed by a captain engineer maintenance of way, with responsibilities comparable to those of a division engineer on most railways. Immediately under him come a first lieutenant roadmaster, a first lieutenant bridge and building supervisor, and a second lieutenant assistant engineer maintenance of way.

The track forces on the road are organized into six section gangs of approximately 11 men each, two of the gangs being classed as yard gangs and located at Camps Claiborne and Polk, and the other four, as line gangs, each with 11 miles of track intermediate between the two terminals. Each of the gangs is in charge of a section foreman, with the rating of sergeant, and an assistant foreman, with the rating of corporal. Over all of the gangs is a general foreman, with the rating of technical sergeant. Specialists in the gangs, such as welders and machine operators, have ratings of technicians, fourth and fifth grade, while the remainder of

the men are privates of various grades.

The bridge and building forces on the road include four gangs of 15 men each, each with a foreman with the rating of staff sergeant. All of the men in the b. & b. gangs are privates, first class, except, again, for such specialists as welders, crane operators, air compressor operators, etc., who hold ratings of technicians, fourth or fifth grade.

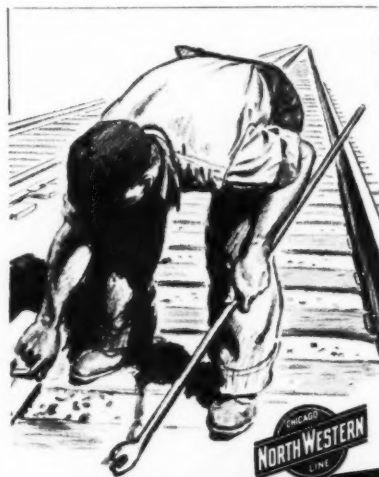
As the result of the construction of the line, the maintenance forces have available to them nine 9-yd. tractor-scraper units, three 12-yd. tractor-scraper units, four 6-yd. tractor-scraper units, eight tractor bulldozers and four draglines, all of which will prove valuable in the large amount of embankment strengthening, cut widening and general right-of-way work still to be done. In addition, they have a Burro rail crane and the service of a Jordan spreader rented from the Missouri Pacific, and each gang is equipped with a suitable motor car, with an extra light inspection-type car available for the use of the roadmaster and other general officers. At the present time, few power tools, other than a welding and cutting outfit and a compressor, are available to the track and bridge gangs, although requisitions have been made for power track jacks and tamping equipment to carry out the large amount of final surfacing necessary on the line, and such surface maintenance as will be required.

Heavy Turnover Expected

Just how the new railroad will be used to train consecutive groups of military maintenance of way and structures men—particularly as regards the scope, extent and period of their training, has not been fully determined as yet, but, in the light of the known program of the Military Railway Service to train thousands of men in the various phases of railway operation and maintenance, using the new railway as one of the principal points of training, it is evident

that there will be a constant shift in personnel in the railway organization as the men complete their training and are prepared for group action within or behind any theatre of operation to which they may be assigned.

All of the general activities of the 711th Engineer Battalion, Railway Operating, at Camp Claiborne, as well as those of the other railway operating battalions being formed throughout the country, under the Military Railway Service, are under the general direction of Brig. Gen. Carl R. Gray, Jr., general manager of the service, with headquarters at St. Paul, Minn., while the immediate command of the 711th Engineer Battalion is Lt. Col. G. M. Welch, formerly assistant division superintendent of the Chicago, St. Paul, Minneapolis & Omaha, at St. James, Minn.



Another Sentry ON GUARD

Keen eyes scrutinize every inch of rail and tie. Nothing must be overlooked . . . nothing must be amiss. For over these rails America's fighting forces travel . . . over them, too, speed the armaments of war and the food so essential to victory.

Day in and day out, in fair weather and foul, this "North Western" trackwalker does "sentry duty." Where mechanical perfection leaves off his work begins. True, his duties are not spectacular; few even realize how essential they are. Yet he knows his responsibility and never for a moment does he relax vigilance.

America's railroads are America's life lines. To keep them open is our job. "North Western" has been serving the nation, in war and in peace, for almost a century. Now, as in generations past, we consider it a privilege to do so.

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Your Safest Investment—Buy War
Bonds and Stamps

Advertisement, Which Appeared in Chicago Newspapers Recently, Features the Important Part Being Played by the Track Forces in Providing Adequate, Safe, War-Time Rail Transportation

Advanced Timber Practices

Prove Their Worth
on the B. & O.*

The large-scale treating and preframing of bridge and other structural timbers on the Baltimore & Ohio have resulted in substantial savings and other advantages, as related by Mr. Petri in this article. He also reviews the introduction and growth of these practices on his road, describes recent developments in both practices, and discusses many other pertinent phases of the subject

By P. Petri

Chief Engineer Maintenance,
Baltimore & Ohio, Baltimore, Md.



TREATED structural timber was used only to a very limited extent in bridges and trestles on the Baltimore & Ohio prior to 1924. In that year the practice of treating such timber was begun on a fair-

ly large scale, and since 1925 practically all timber used for permanent repairs to these structures has been treated. Most of the heavy framing timber for docks and piers has been treated, and a considerable amount of treated timber has also been used in buildings, although its use in the latter connection has generally been for special purposes or to meet local conditions.

The decision to treat structural timber for use on the B. & O. was based on favorable results obtained

by other roads and on our own experience in the extensive use of treated cross and switch ties. It was also realized that, if the maximum benefit was to be obtained from treatment, it would be necessary to preframe the timber prior to treating it, so far as this was practicable, and our progress in the treatment of timber has been attended by a parallel development in methods and programs for framing it.

Definite Conclusions

The use of treated structural timber by the B. & O. has, therefore, been on a sufficiently large scale for a period of sixteen years, to admit of some definite conclusions as to its merits. It is not possible, of course, to determine, as yet, the ultimate average life of such timber, but it can be stated safely that a sufficient increase in life over that of untreated timber has been obtained to justify the cost of treatment, including plant investment. Recent years have seen the introduction of improved methods of framing timbers and the development of a greater variety of uses for treated wood, as well as the utilization of lower grades of timber.



Fully Preframed and Treated—
This Structure Over Antietam
Creek, on the B. & O., Was Re-
built in 1938-1939

Prior to 1924, our use of timber for bridge and dock work was confined generally to three kinds of wood, fir, white oak and long-leaf pine, and while the bulk of our requirements for such uses are still being supplied in these woods, we are now using red as well as white oak, a lower grade of long-leaf pine and a considerable quantity of short-leaf pine, the latter being employed principally for guard timbers, joists, walkways and platforms. This has produced a large saving in initial cost, at no sacrifice in life expectancy or structural strength.

Preframing Adds Life

Closely associated with the treatment of structural timbers is the practice of preframing timber before treatment. It is becoming increasingly evident that, although the life of timber is greatly prolonged by treatment, still longer life can be obtained by reducing the amount of framing in the field to a minimum. Any decay that has been observed in treated timber has almost invariably originated in surfaces from which the treated wood has been removed in framing.

*From an article published in the Baltimore & Ohio Magazine.

When the treatment of structural timber was started on an extensive scale at our plant in Green Spring, W. Va., in 1925, and for several years thereafter, production varied from 8,000,000 to 9,000,000 ft. b.m. per annum, of which approximately fifty per cent passed through the framing mill, receiving at least some degree of preframing. This timber consisted principally of bridge ties; guard timbers and walkway joists, which were completely framed; trestle stringers and caps, which were sized and cut to length; and miscellaneous trestle timber which was merely cut to length.

Further study of both field and mill practices, and refinements in methods of obtaining necessary field measurements, have now made possible a considerable increase in the extent to which timber is preframed, so that at the present time approximately two-thirds of our total treated production passes through the framing mill. All bridge-deck material is now completely preframed, as well as all trestle material except that longitudinal bracing is not bored, this step being omitted to permit greater latitude in field erection. For spot renewals of stringers and posts, preboring is also usually omitted.

Preframing Costs Less

A large amount of timber is also preframed for miscellaneous uses. The timber for four large transfer bridges has been completely preframed, all members having been fully cut and bored and all chord members completely assembled before treatment. These structures involved about 75,000 ft. b.m. of timber each, and the work done at the mill, including all framing and partial assembly, cost \$15 per M. b.m. This performance compares with a field cost of \$35 to \$40 per M. b.m. for similar work formerly done at bridge sites. This is an indication of the scope of preframing work that is possible and of the actual direct savings that can be obtained, in addition to the indirect benefit that is realized as a result of the better protection that is afforded the treated timber.

The following comparison illustrates the evolution that has taken place in the application of preframing on the B. & O. During the first five years of the operation of the wood-working mill at Green Spring, approximately fifty per cent of the timber passing through the mill consisted of bridge deck material; forty per cent consisted of stringers and caps and ten per cent involved miscellaneous framing. In 1939, the total mill output was 2,757,430 ft. b.m. Of this

total, 939,065 ft. b.m. (34 per cent) was bridge deck material; 345,713 ft. b.m. (13 per cent) consisted of stringers and caps, and 1,472,652 ft. b.m. (53 per cent) was miscellaneous framing. A very decided increase in diversified framing is observed here, although the total amount of timber handled actually decreased about one third in 1939, as compared with the annual average of the first five years of operation. This decrease is due primarily to the benefits being derived because of the longer life of treated timber, rather than as a result of the curtailment of maintenance renewals.

Additional Equipment

Although some additions have been made to the equipment in the preframing plant, the enlarged scope of the work has been accomplished with only a slight increase in plant investment. The additions that have been made to the equipment include portable saws, boring machines and two band saws.

While the use of treated timber in making repairs to buildings is generally confined to foundation material, it has been placed in such structures as engine houses, its principal uses here being for roof framing and sheathing, although it is also used for pit timbers and jacking plank. In addition, a large amount of treated timber has been used in crib and bulkhead walls. Both second-hand and new timber have been employed in such structures, and in several instances, by careful designing, the crib members of the walls have been completely precut and bored.

One of the major developments in our treating practice has been the change that has occurred in the kind of treatment that is given bridge ties and other deck material for open-deck steel bridges. To minimize the fire hazard on such bridges, the preservative employed in the treatment of timbers used on them was changed in 1933 from creosote to Wolman salts, and in 1939, it was further changed to chromated zinc chloride. Because of the comparatively short periods of time during which they have been used, it is not possible to determine the merits of the latter two preservatives in comparison with creosote, but they undoubtedly have a fire resistant value, and for that reason they have also been employed in the treatment of lumber for use in enginehouse roofs, etc.

Anti-Splitting Devices

Among the minor developments in treating and framing procedure may be mentioned the use of anti-splitting

devices, particularly for oak bridge ties and timbers. Owing to conditions that have existed for several years, it has been impracticable, in many instances, to obtain the desired amount of seasoning for timber, and the necessity for treating it while it is still fairly green has in some instances resulted in excessive splitting and checking of the timber after treatment. When salts are employed as the preservative, this condition is intensified. As a result, a policy of placing drive dowels in all oak ties during the framing process has been adopted, while similar dowels are used in other timbers when conditions indicate this to be desirable. The added cost is quite small, averaging about three to four cents per dowel, and it is believed that a greatly improved condition of the timber subsequent to treatment results from the use of these devices, far outweighing the added cost involved.

Timber Connectors

As a further means of obtaining a better utilization of timber, we are now exploring the use of special timber connectors that are designed greatly to increase the strength of timber joints fastened with bolts. Such devices will permit the use of laminated or built-up timber members, thereby widening the uses of many smaller sizes of timber as structural units.

In the sixteen years up to and including July, 1940, during which period treated timber has been used extensively for structural purposes on the B. & O., approximately 97,000,000 ft. b.m. of timber have been treated and used, of which approximately 53,500,000 ft. b.m. were preframed. That this treated timber has a life expectancy much in excess of untreated material, cannot well be doubted. Also, since timber treatment permits the use of lower grades and cheaper varieties of wood, the actual cost of treated material used in regular maintenance service is less than the expense that would have been incurred if it had been necessary to make renewals in the same kind of untreated timber that was used originally.

It is known also that the preframing of timber at a central point, which has developed as a corollary of treatment, has produced large direct savings annually in the maintenance of bridges and structures. The fact that the average cost of mill work of this character at Green Spring, including all overhead and indirect charges, has been only \$5.28 per M. b.m. is conclusive evidence of the extent of these savings.



The Bridge Dismantled (Left and Below) Was 1,800 Ft. Long and 165 Ft. High at Its Highest Point

Big Bridge Brought Down In One Operation

ONE of the largest railroad bridges ever to be dismantled as the result of a line abandonment was recently demolished and scrapped in connection with the retirement of a portion of the Wilkes-Barre & Eastern, a line 62 miles long that extended from a point near Wilkes-Barre, Pa., southeasterly through the Pocono mountains to Stroudsburg, Pa. Built during the early 1890's, all but about eight miles of the line was abandoned in 1939 and taken up in 1940.

Location and Construction

The large bridge that was dismantled in connection with the retirement of the line was located near Springbrook, Pa., 16 miles east of Wilkes-Barre, where it spanned a deep ravine carrying a stream known as Panther creek. Constructed entirely of wrought iron, it was 1,800 ft. long and 165 ft. high at the point of maximum height. It consisted of deck plate-girder spans supported on structural tower piers.

Each pier embodied four batter posts, one at each corner, consisting in each case of two 12-in. channels placed back to back. These posts were founded on masonry pedestals. The piers were liberally reinforced with horizontal and diagonal members. While the diagonal bracing and certain of the horizontal members consisted of single angles, the principal horizontal struts were of built-up box construction, consisting of four angles with lattice bars. The presence of these built-up members at intervals in the height of the piers had the

effect of dividing them into stories.

The problem presented in dismantling this bridge was to pull it down to the ground so that the members could be cut to charging-box size with oxy-acetylene torches. In deciding on the procedure to be followed, consideration was given to the fact that it was flanked closely on both sides by a dense forest growth, which was known to be infested with rattle snakes. Hence, to avoid the necessity of working in these woods, which would have been the case if the structure had been pulled over transversely, it was decided to collapse it longitudinally, the plan being to pull practically the entire structure down in a single operation.

Procedure Followed

In spite of the size and length of the structure, this proved to be a relatively simple task. In preparation for this work, the tower piers were weakened by removing all horizontal and diagonal bracing from the two lower stories in each tower. Also, since it was desired to pull the structure in the northerly direction in the collapsing operation, it was necessary to clear the way by first removing the two spans at the northerly end. This was done by severing the anchor and expansion joint bolts with cutting torches and then tipping these two spans to one side, using a portable hoist mounted on a truck.

As another preliminary step, the rails and all the ties and other deck materials were removed from the bridge. Also the anchor bolt and ex-



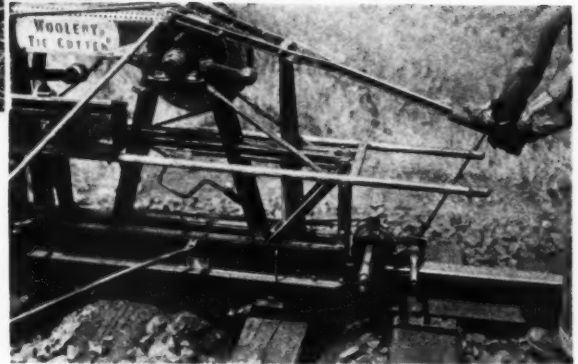
After the Bridge Had Been Pulled Down, the Members Were Reduced As Necessary With Cutting Torches and Trucked Away

pansion joint connections throughout the length of the span were severed with cutting torches. With all these preparations completed, the structure was in such a weakened state that it was a simple matter to collapse it by exerting a pull in the northerly direction, this being done with the truck-mounted hoist which applied the pull through a steel cable.

The work of dismantling this bridge was performed under contract by the A. A. Morrison Company, Buffalo, N. Y. We are indebted for the information contained in this article to the Air Reduction Sales Company, New York.



Saws—



Above — Best Results Are Obtained When Two of the Tie Cutters Are Used Together. Right—Close-up of a Tie Cutter in Operation

SUBSTANTIAL economies in tie renewals are now being effected on the New York, New Haven & Hartford by the use of a number of power-operated machines for cutting the old ties in pieces to facilitate their removal from the track. By thus precluding the necessity for digging in ties, the experience of this road has been that the use of these machines not only reduces the labor and, hence, the cost, of making tie renewals in both stone and gravel ballast, but also permits the tie renewal work to be carried out with minimum disturbance to the roadbed.

Results of Tests

To determine the extent of the cost savings that may be expected to result through the use of the tie cutters, a number of comparative tests have been conducted. In one such test, which was made in stone ballast, a gang first installed ties for six days by the usual method, that is, without the use of the tie cutter, and then spent five days renewing ties with the aid of the machine. In the first period, this gang installed an average of 57 ties per day, or 4 per man-day. During the second period the average output per day was 84 ties, or 6.4 per man-day. This represented an increase in output per man of 60 per cent.

A similar test was conducted in gravel ballast in which a gang worked one day without the machine and one day with it. In the first instance, that is, when the ties were dug in by the usual method, the gang renewed 125 ties, or 7.8 ties per man-day. On the other hand, using the machine, the day's production rose to 260 ties, or 16.2 per man-day. In this test the increase in output per man was more than 100 per cent. Not all of the tests that were conducted showed the sharp

contrast presented by these figures, although in practically all cases appreciable savings were indicated.

Details of Cutters

The machines that are in use on the New Haven are known as Woolery tie cutters and are designed to cut crossties into three pieces by making a cut close to the gage side of each rail, thereby permitting the pieces to be lifted directly out of the track without first removing the ballast from one of the adjacent cribs, as is necessary with the digging-in method. Briefly, the machine consists of a power-driven saw mounted in a frame that operates on the rails, the arrangement being such that the machine proper is located over one of the rails with a stabilizer arm extending to the other. The cutting tool, consisting of a removable saw blade, is fastened to the lower end of a tapered steel arm that is placed ver-

Power machines that cut old ties in three pieces in preparation for removing them from the track are being used extensively in both rock and gravel ballast, on the New Haven, where they are effecting appreciable economies in the cost of renewals. Also, their use results in less disturbance to the track than by digging in. This article tells of the experiences of this road with the tie cutters, of which it has 14, and the manner in which they are used

tically, the upper end of which is fastened with a pivot connection to a horizontal arm, by means of which the saw is raised and lowered by the operator. A reciprocating motion of the saw arm, transverse to the tie, is imparted by means of a rocker arm that is attached at one end to the crank of a two-horsepower gasoline engine.

Control of the rate of cutting is effected by the operator varying the pressure applied on the handle in accordance with the character of the wood being cut. The instant that the saw blade penetrates the bottom of the tie, the operator withdraws it from the cut with a quick upward movement of the handle. A number of spare saw blades are provided with each machine, and for sharpening them, a grinding wheel, with a power take-off from the engine, is provided on the cutter.

The tie cutters were first used on the New Haven in 1939, when four

Cut Tie Renewal Costs

on the New Haven



A Prying Action Is Used to Remove the End Pieces After the Cuts Have Been Made by the Saws

of them were obtained. Two of these were purchased for use in connection with tie renewals, but the other two were acquired primarily for a different purpose. At that time a large ballast-cleaning outfit of the on-track type was being operated on this road, and, when cleaning ballast in the inter-track space, it was necessary to cut off the ends of over-size ties so that they would not interfere with the operation of the digging unit on the

ballast cleaner. At first it was the practice to chop off the ends of the long ties with an axe, but this proved to be a slow and tedious process. Two of the machines were obtained for cutting off the ends of these long ties.

To adapt the machines for this task, each of them was mounted by means of a special rig on a push-car in such a manner that it projected out to one side the necessary distance to space the saw blade the proper

distance from the rail. When used for this purpose the machines proved highly satisfactory. Subsequently, when no longer needed in connection with the ballast-cleaning work, these units were released for use in making tie renewals.

Now Has 14 Machines

In 1940, the economy of the tie cutters in tie-renewal work having been demonstrated by experience and tests with the units obtained previously, 10 additional machines were acquired, making a total of 14. This permits two or three of the machines to be assigned to each division, and generally it works out that there is one for each track supervisor, although this does not preclude the shifting of the machines from one supervisor's territory to another if, as is generally the case, it is desired to use two of them with the same tie-renewal gang.

Gang Organization

When using the tie cutters, the same gangs are employed for making tie renewals as formerly; that is, there has been no fundamental change in the composition of the gangs that carry out such work, although, as is to be expected, the organization of the individual gangs has been revised as necessary to adapt them to the use of the tie cutters. On this road, heavy out-of-face maintenance tasks, such as tie renewals, ballasting and rail laying, are performed by what are known as heavy-work or "line" gangs, normally containing 10 to 15 men, and these gangs are ordinarily used in making renewals with the tie cutters. However, when making tie renewals with these machines, it is a common practice to increase the size of the line gangs, either by putting on extra men or by bunching gangs, in

Left Below—In Stone Ballast, Preparing the Tie Bed to Receive a New Tie. Right—Inserting a New Tie



order to obtain the organization that will give the maximum efficiency.

It has been the experience of the New Haven that the best results are obtained when two tie cutters are used with each gang; if only one machine is used it is necessary, after making cuts in the ties at one rail, to retrace the distance covered for the purpose of making the cuts at the other rail. When two machines are used, the gang organization usually embodies about 20 men, although it is not uncommon to use a greater number, as the experience has been that two of the machines are capable of keeping up with a gang of about 30 men. If an organization with fewer than 30 men is used, the tie cutters usually finish their work somewhat ahead of quitting time, in which event the machine operators devote the remaining time to sharpening saw blades, or, this finished, they assist in the other work.

When renewing ties by using the cutting machines (this discussion is based on the use of two saws) the first operation is to dig away small pockets of ballast at the points alongside each tie where the cuts are to be made, this being necessary so that the saw blade will not come in contact with the ballast as it progresses downward through the tie. When the work is being done in stone ballast two men are needed for this operation; in gravel ballast one is sufficient. These men are followed by the cutting machines, one making the cuts at one rail and the other at the other rail. For operating each of the machines, a man is chosen from the gang who is known to possess some mechanical ability. The remainder of the organization consists of one man pulling the spikes from the cut ties; 2 men removing the tie pieces from the track; 12 or 14 men, and sometimes more, cleaning out the cribs and installing the new ties; and a water boy. The gang is in charge of a foreman and an assistant foreman.

Removing the Ties

In taking out the tie pieces, the tie plates are first removed by springing up the rail, after which each of the end pieces is pried out from under the rail by means of a suitable tool, usually a lining bar, that is inserted into the cut. The center section of the tie can then be lifted bodily out of the track. To facilitate the removal of the end pieces, a small amount of ballast is dug away from each end of each tie. After a tie has been removed, any loose ballast that may have fallen into the opening is forked out, and the tie bed is shaped as necessary to permit the new tie to

be inserted. In double-track territory, the practice is to carry the renewals forward in both tracks by working on one track for part of the day and then shifting over to the other track.

Incidental Uses

Aside from the fact that the tie cutters are reducing the cost of tie renewals on the New Haven, this road has found that they have a number of incidental advantages and uses. One of these, as mentioned previously, is the cutting off of the ends of long ties in the inter-track space when it is planned to use an on-track ballast-cleaning outfit. Also, the ma-

chines have been used to advantage to cut off switch ties that are left in track after turnouts have been removed. The cutting of such ties to the approximate length of crossties is done when they are in such condition as not to justify their removal to another location but, at the same time, are considered good for another year or two of service in their present location. Finally, when the tie cutters are employed in regular tie-renewal service, they have proved particularly advantageous when used in narrow rock cuts where, because of the close clearances, the removal of ties from the track in one piece is frequently a difficult and expensive task.

Hold Fast to Standards Regardless of Tie Scarcity*

Urges W. D. Simpson

Assistant Chief Engineer M. of W.,
Seaboard Railway, Norfolk, Va.

AMONG the many difficult situations that are being imposed on the railroads by the present emergency is an indicated crosstie shortage in many parts of the country. It isn't alone the fact that we may not be able to get the quantity of ties needed that concerns us, or that it will be difficult to get them; it is also the temptation presented by the situation to lower our standards and thus destroy in a year or two the results of 20 years' work in building up and improving the quality of our ties. If we allow this to happen, it will be a costly economic error and also a pity.

Ties Playing Important Part

The excellent quality of tie stocks to be found today in the yards owned and operated by commercial tie producers and in those operated by railroads did not just happen. These ties are the result of many years of planning and organization. Specifications had to be written and revised as study and changed conditions necessitated. Men to produce these ties had to be trained. We have learned the kind of ties that are needed; we have told the producers and they have produced them in a highly satisfactory manner.

You men who have produced the ties that we are using today have a

right to be proud of the part that you have played in building up the railroads to the point where they can handle the present volume of traffic at the speeds now necessary. The quality of track surface on practically every Class I railroad of the country is far better today than ever before. If that were not so, our rail transportation would be in a sad condition. The better ties now being used are an important factor in that improvement. More extensive use of treatment and improved standards have produced these better ties, and it must not be overlooked that these improved standards were adopted to a large extent during the recent years of depression, and notwithstanding the fact that many railway managements were confronted with difficulty in paying for the ties we needed. To allow anything to happen now that can be avoided, that will tend to destroy the present very satisfactory quality of ties now used generally, will be a misfortune.

Demands Increase

The present emergency will tempt many to accept sub-standard ties. Some of us will get nervous as our stocks become lower and demands become greater. Under such conditions, it isn't beyond the realm of possibility that our managements may find it necessary that we get ties, without regard for present high standards.

The need for ties today on some roads is urgent because of the many ties being used in tracks constructed

*An address presented before the twenty-fourth annual convention of the Railway Tie Association, at Cincinnati, Ohio.

to serve military establishments. It is doubtful if anyone knows the number of ties that have been used already or that will be required in the construction of such tracks. On one railroad, the number of ties furnished for such construction, and for auxiliary tracks constructed by the railroad because of that service, has, in the last several months, amounted to one-fifth of the annual requirements of the road for normal maintenance, and these demands are continuing. They appear unexpectedly over night and must be met promptly, without any opportunity to prepare for them.

In some instances, instead of the railroads furnishing the ties, contractors acquire them, and, apparently, under a variety of specifications. I say variety, because in the last few months I have known the requirements to vary from one calling alone for Size 3 mixed oaks, untreated, bought by a contractor without inspection, to a demand for all Size 5, creosoted, meeting proper specifications. In territories where conditions such as these prevail, the railroads find production demoralized, and much time, effort and expense are necessary to get standard ties produced again. Price competition presents a temptation to depart from our standards, but we should not yield. In the end, we will be better off if we pay more for ties and insist upon the qualities we need. In its last report, the Tie committee of the American Railway Engineering Association cited instances where competition did not result in relaxed inspection.

I am not suggesting that only ties that comply with our specifications fully are required for all uses and under all conditions. Certainly there are requirements for ties for purely temporary use where economy can be realized by the utilization of a specification different from ours, but whatever is needed should be determined by some one who knows what it is all about.

The producers have always been able to find a market somewhere for those ties manufactured inadvertently that do not meet our specifications satisfactorily. Let's hope and arrange that such ties will always find their way into the same channels.

Relaxed Standards A Problem

One of the most undesirable effects of any lessening of our tie standards would be on the morale of our forces that use the ties. I dare to make the statement that there is not a trackman or track foreman of long experience in the country who would conscientiously subscribe to the thought that we can afford, in any particular, to

let down in our present physical requirements for ties.

One large problem with which we both would be confronted if standards are lessened would be the task of re-establishing quality production. In this, as in many other things, it is easier to tear down than to build up. We must not lose sight of the fact that when inspection is relaxed the manufacturer becomes accustomed to this type of inspection and is governed accordingly in his timber buying and manufacture. Then, when the specifications are again adhered to, his losses are offset by any prior gain he may have realized.

A lessening of standards for ties does not increase the supply. Its overall effect simply lowers the average quality and average life of all ties obtained. What we buy in a crosstie is service life, but the kind of service we get from that tie during its service life is also of great importance. It is possible to produce ties that will have a satisfactory length of life, but which, because of their shape, will be unsatisfactory for the purpose for which we use them. It is ties that can produce and maintain a uniform foundation for the track throughout a long life, that are needed.

No matter what the cost of poorer ties, there can be no economy in their purchase, because either their service life or the quality of their service will be less, with the result, beyond doubt, that the cost per tie year in service will be increased, increasing maintenance costs generally. And, since the use of inferior ties results in shortened average life, there can be no suggestion that conservation is promoted.

Must Hold to Standards

We cannot estimate how long this present emergency will last; neither can we predict when the period of financial adjustment will come. With this in mind, every tie placed in our permanent tracks should be a long-life tie, so that our track structure will withstand whatever the future may require of it. If it is necessary that we get along with fewer ties during this emergency, that is another reason why we should insist on ties competent to do the job.

The economic aspect of this tie situation is an important consideration. While the loss incurred in the case of one tie may be considered negligible, if this loss affects any appreciable part of the millions of ties used by the Class I railroads each year, or extends for a sufficient length of time to affect appreciably the average life of the more than one billion ties now in the tracks of Class I railroads, it amounts to a large figure.

New Book

Bridge and Building Proceedings

PROCEEDINGS of the American Railway Bridge and Building Association, forty-eighth annual convention. 246 pages, illustrated, 6 in. by 9 in. Bound in cloth. Published by the association, A. G. Shaver, secretary, 310 South Michigan avenue, Chicago. Price \$2.

Meeting in the shadow of the probable involvement of this nation in a war that materialized for us only a few weeks after the convention, the program of the forty-eighth meeting of the association, held in Chicago, on October 14-16, 1941, contained many features relating to the handling of bridge and building work under the abnormal conditions this prospect imposed. This volume is, therefore, somewhat different from those that have preceded it and, while it contains a wide range of practical information of value to those who are engaged in the maintenance of railway bridges, buildings and water service, it also contains several new notes. Indicating the range of subjects considered, the reports include studies relating to the protection of bridges and roadway against river-bank erosion; off-track equipment in bridge construction and maintenance; the maintenance and repair of bridge and building equipment; the modernization of small stations; welding in water service; developments in paint removal; and efficient methods of transporting water service gangs.

It is particularly in the papers and addresses, and the discussions that followed their presentation, that the notes of anxiety can be detected most strongly, however, for they include such subjects as Maintaining Forces in a Period of Widespread Demand for Skilled Labor, by P. O. Ferris, chief engineer, Delaware & Hudson; Roadway Buildings in a Changing Age, by A. O. Lagerstrom, architect, Chicago, Milwaukee, St. Paul & Pacific; Protection of Roadway Structures Against Sabotage, by E. P. Coffey, chief of technical laboratory, Federal Bureau of Investigation; Effect of the Defense Program on the Procurement of Railroad Materials, by C. E. Smith, vice-president, N. Y. N. H. & H.; What We Can Do in the Face of a Shortage of Materials, by G. A. Haggander, assistant chief engineer, C. B. & Q.; and Modernizing Water Facilities to Meet the Demands of Modern Train Operation, by A. B. Pierce, engineer water supply, Southern.



WHAT'S the Answer?

Where to Unload Cinders

In view of the present demand for cars, is it preferable to unload cinders on the road currently or to store them at the points of origin? Why? What are the advantages? The disadvantages?

Depends on Cars

By GEORGE M. O'ROURKE
Assistant Engineer Maintenance of Way,
Illinois Central, Chicago

In view of the present urgent demand for cars, we believe that where revenue cars are employed for handling cinders, it is preferable to unload carloads of cinders currently, then move the empty coal cars to the mines. Where specially-assigned cars are employed in cinder service, that is, cars designed for handling cinders exclusively, cinders can be moved from cinder pits to places on the road to be unloaded for ballast, bank widening or other purposes, or they can be moved short distances to a storage site if not required on the road. Specially assigned cars should not be sent to points so far distant that they cannot be unloaded and turned back in time to protect the pit.

Unless it is known that a quantity of cinders will be needed for some purpose at some time in the future, and at a rate faster than they are being made, there will be little advantage in storing them. If stored at all, it should be for a short time only; otherwise they will be "dead" when they are used finally.

It is assumed that the question refers to storage in piles on the ground, requiring both unloading and reloading, and that they are not to be held in cars. Where storage piles are built up, the question of availability of cranes or power shovels to do the reloading must be considered. Generally, at the time when the cinders

will be wanted for use these machines will be busy with their regular seasonal work and none can be spared to do the loading. Obviously, there is rarely space available at cinder pits for storing cinders in piles. This means that they must be moved some distance to storage piles, and this will probably result in greater delay to the cars than unloading them currently on the road.

Too Much Handling

By L. G. BYRD
Supervisor of Bridges and Buildings,
Missouri Pacific, Poplar Bluff, Mo.

Cinders are cleaned from locomotive ash pans and fireboxes at engine terminals, and must be loaded and disposed of quickly to avoid accumulations that would otherwise interfere with the operation of the terminal. In rare cases, after the cinder pits have been constructed, adjacent areas are available for disposal of the cinders, but they can afford only temporary outlets. As soon as these temporary dumping grounds are filled, and elsewhere, the cinders must be loaded into cars and hauled away. Some roads provide special cinder cars for this service, while others

To Be Answered in October

1. *What are the causes of pumping joints? What means can be employed to overcome the trouble?*

2. *What measures can be employed to prolong the life of copper valleys, gutters and flashing? Tin valleys and gutters?*

3. *Where a turnout or crossing is of heavier section than the track rails, how far back should the compromise joints be placed? Why? Will this differ where the track is signaled?*

4. *What substitutes for cast and malleable iron can be employed satisfactorily to protect structures over tracks from the effect of locomotive blasts? What are the advantages? The disadvantages?*

5. *Have higher speeds created new requirements with respect to the inspection of tracks and bridges? In what ways? If not, why?*

6. *Are there any advantages in locomotives taking water directly from city mains? Any disadvantages? What precautions should be observed? What maximum delivery is practicable?*

7. *In view of the present limitation on purchases of rail and fastenings, should there be any relaxation in existing standards when classifying rail for reuse? What are the advantages? The disadvantages?*

8. *What method will give best results when applying shellac to new wood surfaces?*

rely on revenue coal cars and endeavor to ship the cinders in the direction of empty movement.

Special cinder cars must be handled promptly and returned to the pit with minimum delay; otherwise it will be necessary to assign too many cars to this service. It is important at any time, except when there is a surplus of such cars, that revenue cars be

Send your answers to any of the questions to the What's the Answer Editor. He will welcome also any questions you wish to have discussed.

unloaded as promptly and continued on their way to the mines. It is doubly important today, when cars are at such a premium for all classes of service, that they shall be kept out of revenue service as little as possible. The problem then resolves itself into two parts, first, how badly are the cinders needed and, second, which method will delay the revenue use of the cars the least.

I know of no time when cinders are not needed for some purpose, except during midwinter, and today with maintenance activities at the highest peak for 12 years, there are not enough to go round, despite the vast tonnage we are hauling and the large locomotive mileage we are piling up. There may be cases where they can be unloaded on a storage pile and the cars released sooner than can be done by unloading where needed on the road. Generally, however, better supervision will reduce this advantage and the benefit to be derived from the use of the cinders will outweigh any slight delays that are unavoidable.

Cinders that are stored soon become worthless through deterioration and are then just so much waste material. Locomotive cinders contain a surprisingly large amount of combustible matter and when piled in quantity are quite likely to catch fire

spontaneously and burn somewhat fiercely, although they rarely break out in flame. A hidden fire in a large cinder pile is exceedingly difficult to extinguish, and putting it out is no assurance that it will not start again. Burned out cinders are of no value for any purpose.

Assuming, however, that they are not allowed to deteriorate and that they do not catch fire, if they are to be used for any purpose, they must eventually be loaded out of storage and unloaded the second time at the point of use. This is one loading and one unloading more than are necessary if the cinders are billed to the point of use as soon as loaded at the pit. Furthermore, a crane with a clamshell bucket or a power shovel, both of which are almost priceless at present, will be tied up while the accumulation is being loaded. Furthermore, there is no prospect that cars will be any more plentiful within the predictable future than they are now.

Taking all of these facts into consideration, there appears to be little merit in the suggestion that cinders be stored. On the other hand, this may be the solution of the cinder problem during severe winter weather when there is little use for them out on the line and the process of unloading becomes exceedingly difficult by reason of freezing.

indicate which one is most favorable from this standpoint.

If the booster pump is to operate continuously while water is being discharged through the pipe line, the pump installation can be made directly in the line so that all of the water passing through the pipe will be handled by the pump. If it is desired to operate the booster pump only part of the time, it can be installed in a by-pass, suitably protected by gate and check valves, so that it will allow the normal discharge from the main pump to flow by when greater discharge is not required, and can then be cut in to increase the flow when needed. This operation can be controlled either manually or automatically.

Place It About Midway

By G. S. CRITES

Division Engineer, Baltimore & Ohio,
Punxsutawney, Pa.

This problem resolves itself into the raising of the hydraulic gradient of the pipe at the outlet or delivery end, thereby increasing the flow. A larger pump at the receiving end of the pipe will increase the head there and raise the hydraulic gradient at this end of the pipe, but the extent to which this increase in the initial head will augment the flow at the delivery end will depend largely on the condition of the inner surface of the pipe.

From the stipulations in the question it can be assumed that the pipe is old, because a new pipe line should be adequate. Old pipe lines are more likely than not to be too small for current requirements. This in itself may be responsible for considerable friction losses, even if the interior surface is smooth. On the other hand, any old pipe line probably has its inner surface roughened by tuberculations or the original area of its section reduced by incrustation, either or both of which will retard the flow by increasing friction and by creating eddies through surface irregularities. The loss in head caused by friction and eddies increases at a rate about equivalent to the square of the velocity of flow. For this reason a very large increase in the initial head might be reduced to a very small increase at the delivery end. An attempt to get sufficient head at the pump to meet delivery requirements might, therefore, blow up the pipe near the pump, for few railway water-service pipe lines are capable of withstanding a pressure of more than about 125 lb.

Generally, the thing to do to increase the flow of such a discharge line, is to step-up the hydraulic

Employing Booster Pumps

When friction losses in a long discharge line reduce its capacity below delivery requirements, what are the relative advantages of installing a larger pump and of employing a booster pump? Where should the latter be located? Why?

Consider Large Pump First

By J. H. DAVIDSON

Water Engineer, Missouri-Kansas-Texas, Parsons, Kan.

First consideration should be given to the effect of installing a larger pump, which would also be capable of developing greater pressure in the discharge line. If, to deliver the required amount of water at the discharge point, it is found by calculation that the pressure developed at any point in the pipe exceeds the safe working pressure for which the line was designed originally, it is obvious that this method should not be employed. In such a case, a booster pump could be installed near the point of discharge, to avoid building up excessive pressures in the long pipe line.

Even if the larger pump would not increase the pressure in the line beyond the safe working limit, it might be found that the extra power required to force the increased quantity of water through the long pipe line would make this method more expensive from an operating standpoint than the operation of a booster pump. Other important considerations include a comparison of the cost of the installations, the availability of power and the problems of supervision and maintenance.

If it becomes desirable to install a booster pump, it will probably be preferable to install it near the point of discharge, as such a location will require the minimum size of pump and the minimum amount of power to operate. A careful calculation of the power requirements for various locations of the booster pump will

gradient to about its initial height at approximately half way along its length by means of a booster pump. The best location for such a pump can

be determined by pressure tests along the pipe line. This pump should be placed where it will not draw a vacuum when working at capacity.

Tool Boxes for Motor Cars

What features should be incorporated in the design of a tool box for motor cars? Why? How should the tools be stored?

Keep Them Separate

By L. G. BYRD

Supervisor of Bridges and Buildings, Poplar Bluff, Mo., Missouri Pacific

This question contains some complications, for several types of gangs are involved. If it refers to working tools for an entire gang, then tool boxes should be constructed for bridge gangs and extra gangs only. If the box is for a bridge gang, it should be so designed as to keep edged tools, such as saws, axes, adzes and augers separate from other tools by means of racks and tills inside the box, suitable for the reception of the several classes of tools mentioned. This will prevent contact with other heavy tools and the consequent damage that is sure to result from such contact. It should be emphasized, however, that a tool box of this design cannot be carried on a motor car, but must be transported on a trailer.

Tool boxes for extra gangs engaged in track work should be constructed with partitions or racks so that each kind of tool can be stowed separately. If this is done, one can remove any tool or kind of tool that is needed without the necessity for moving other tools, as must be done where they are thrown into a receptacle indiscriminately. They should be of such size that all of the tools required by the gang can be transported to the site of the work and allowed to remain until the job is completed—or they can be moved with the gang, if it is one that advances as the work progresses. If the gang is large, two or more such boxes may be required. These boxes cannot be handled on motor cars, but should be transported on trailers or push cars under flag protection.

Today, section gangs are generally small, and do not require a large supply of tools. Section cars should be provided with trays on each side to permit bars, shovels, forks, picks and scoops to be placed firmly in them. Track jacks should also be placed inside the tray, at the rear end, and

in such a way that it will not fall from the car. Weight should never be added to a motor car to such an extent, however, that it cannot be removed from the track quickly in an emergency.

Small, light tools, such as wrenches and hammers, are placed under the seat, in a specially-designed tool box. Flags should be placed in separate holders at the front end, one on each side. A special metal tray with a cover, should be fastened at the front end of all motor cars, to hold torpedoes and fusees, which should be kept separate from each other and from all tools and other supplies.

All Cars Should Have Them

By ENGINEER MAINTENANCE OF WAY

Tool boxes should be provided on all motor cars used by section and carpenter gangs. They are not needed on cars that are used exclusively for the transportation of men, such as extra gangs between their camp and their work, for in this service the motor car is employed primarily as a hauling unit to pull a train of trailers loaded with men. Inspection cars are generally required to carry a few light tools or minor supplies and should have tool boxes, but this is another story and I assume it was not intended to be covered by the question.

Section gangs are small today compared with the late twenties, but even in the face of a real shortage in track labor, the average section gang is larger today than it was only three or four years ago, as the need for more intensive maintenance is emphasized by increased traffic density. A section gang uses in its daily work almost every type of hand tool employed in track maintenance and, obviously, they must be carried on the motor car at all times, for a section gang should never be separated from its tools. Precautions are required to eliminate hazards to the men riding on the car by reason of the loading

of the tools, and they must be prevented from falling off, thereby also creating a serious hazard of both derailment and personal injury.

Experience has demonstrated that safety can best be conserved by providing tool trays, one on each side of the car, in which the tools should be stowed securely. Lining, tamping and claw bars and track wrenches should be placed in the tray before other tools, as they will then lie flat and remain undisturbed by the vibration or other motion of the car. Shovels, forks, scoops and picks should be nested in such a way that they will occupy the minimum amount of space. Shovels and scoops should be placed with their cutting edges down and forks with the points of the tines in the same way. This will eliminate considerable of the hazard that is inherent in handling tools on motor cars. Spike mauls and sledges should be placed with the handles and heads horizontal, and below the shovels, scoops, etc., if they are in the same tray. Hatchets, axes and adzes should always be placed with their cutting edges down, and it is desirable that they be held in this position by means of loops or pockets of leather, if this is practical.

Gages and levels should never be placed under other tools or stowed so that they will be buried if the tools shift from any cause. Levels, especially, should be protected against damage and should preferably be carried in a specially-constructed rack that will keep them separate. Track jacks should be placed *inside* the tray, never with the foot projecting from the front of the car as has been done sometimes with disastrous results. They should be stowed at the rear of the car in such a way that they cannot fall off. Water kegs have often caused serious accidents by falling off in front of motor cars in motion. To eliminate this hazard, a special rack should be provided which will insure that the keg will not fall off the car at either the front or back.

Flagging equipment, particularly torpedoes and fuses, is seldom looked upon by section gangs with the respect it deserves. An exploding torpedo can take a hand off, and lock-jaw can result from lacerations caused by splinters from the cover of a torpedo. The fact that such explosions seldom occur spontaneously and that injuries from this cause are not numerous does not diminish the hazard, for they may occur unexpectedly at any time. Fusees that have been overheated may also explode while being ignited; and torpedoes and fusees mixed make a

dangerous combination. For this reason a separate metal receptacle should be provided, with separate compartments for flags, fusees and

torpedoes, and this receptacle should not be thrown in with the tools, but should be kept where it will be accessible instantly in emergencies.

Supporting Weak Girders

What precautions should be observed when supporting a weak girder span?

A Loose Fit Is Best

By G. L. STALEY

Engineer of Bridges, Missouri-Kansas-Texas, St. Louis, Mo.

Weak girders have been supported on falsework for many years, with no apparent precautions having been taken either in locating the bents or in the type of bearing used at the contacts of the girder with the bents, with entire success as to the results desired and obtained. However, it is good practice to use some degree of care, such as placing the bents under intermediate stiffeners and at intermediate cross frames, cutting the pile so that the falsework caps can be placed without wedges and at such elevations that there will be a loose fit between the girder flanges and the caps. This should be done to relieve the girders of only a part of the live load.

The loose fit is desirable also to avoid bending the outstanding legs of the flange angles and thus prevent excessive stresses in the flange rivets. In many cases the unit bearing on the wood cap is very high. This can be overcome, however, if considered necessary, by using steel plates or hardwood blocks for the bearing.

Allow the Span to Deflect

By ENGINEER OF BRIDGES

Supporting a weak girder span generally involves one support at the center, although streambed conditions or navigation requirements may call for two supports under the span. The support should generally be of driven piles, although conditions may make a framed timber support either desirable or necessary. The number of bents in the support will depend on the load imposed and the length of the span.

Where the stream carries much drift, it may be advisable to put an upstream nose on the support, and there may also be situations where a downstream nose is desirable. Generally, the support should be de-

signed to take only vertical load from the span, together with such lateral loads as may be set up by current and drift.

If the span is to be carried on falsework for a long period, it is

preferable to place steel stiffeners over the new support. If it is to be carried for a relatively short time, wood stiffeners, wedged tightly between the flanges and bolted through the web, will be adequate. If timber stiffeners are used, the support blocking directly under the girders should be long enough so that the flange rivets will not be overstressed. The tight-fitting wood stiffeners will transmit some of the load to the top flanges and thus lessen the likelihood of cupping the horizontal portion of the bottom flange as a result of possible poor bearing conditions. In many instances, conditions may be such that it will be desirable to allow the span deflect a certain amount before the new support takes the load.

Insulating Existing Buildings

What factors should be given consideration in determining whether to insulate an existing building? What is the weight of each?

Pays Its Way

By A. L. SPARKS

Architect, Missouri-Kansas-Texas, St. Louis, Mo.

One can scarcely discuss the subject of insulation without putting some propaganda in it, for it is doubtful whether there has been any building product developed in recent years concerning which more plausible arguments and more justifiable claims for its use can be advanced. Probably the most convincing argument of all is that it pays its way. When one is considering the advisability of insulating a structure, the following factors are important:

1. Is the building worth insulating?
2. Are the health and comfort of the employees sufficiently important to justify the expenditure? That is, will there be enough improvement to warrant it?
3. Is the saving of fuel of any consequence?
4. Will the added comfort of patrons and customers be sufficient to be noticeable.

Assuming that the building under consideration is of basically sound construction, and that it is worth while to repair it and continue it in service, the more dilapidated it is the better the results will be relatively by reason of the application of insulation. Despite the course of events in the world today, the American way of life trends definitely toward better working and living conditions. We

are habitually dilatory and negligent about making improvements that will benefit our fellow workers; yet we are really interested in their health and well being. Aside from this, there is a cold-blooded economic consideration that cannot be ignored. Layoffs by reason of sickness are expensive to the employer as well as to the employee. Again, discomfort by reason of temperatures that are too high or too low creates low efficiency in one's work, and this is also expensive. These facts, taken together, indicate that any reasonable expenditure can be justified that will add to the comfort of the employee, reduce the incidence of sickness, and thereby add to his efficiency. As a corollary, the more persons that are employed in the building, the greater the economic justification for installing insulation.

In some respects, the dollar saving in fuel by reason of insulation is a relative matter. If the heat losses are already small the saving will be correspondingly small; if the losses are large, the saving will be large. If one small building is insulated, out of a large group which is heated from a central plant, the saving in fuel costs probably could not be detected. If, on the other hand, the boilers are overloaded, and all of the buildings in the group have the heat losses checked by insulating them, it is more than probable that the overload on the boiler will be reduced, possibly to the point where an increase in the size of the plant will become unnecessary.

Today, many homes are insulated,

and most passenger and sleeping cars are air conditioned. When patrons leave air-conditioned homes or cars and are compelled to wait or transact their business in overheated or underheated buildings, they are likely to lose some of the friendliness they might otherwise feel toward the railway, and the adverse advertising is detrimental and does not pay.

An Economic Problem

By GENERAL INSPECTOR OF BUILDINGS

Most improvements to industrial property are predicated on the profit that can be derived from the expenditures necessary to make them. Profits from the application of insulation to railway buildings can be classified under three heads, the first of which includes the direct savings by reason of reduced fuel consumption, less investment in heating facilities and a lower rate of depreciation on some classes of buildings through a reduction in condensation. The other two are indirect and cannot be determined accurately.

In determining whether to insulate a building, one should consider the use to which it is being put; its probable life; its physical condition; the number of persons to be affected by the decision; the character of their work; whether the building is used by the public, in what way and to what extent; what the cost of the installation will be; and the savings to be derived. If the building is old and its probable life is short, it may not be economically feasible to apply insulation. On the other hand, it may not be the best physical condition and yet have a long prospective life. Too many railway buildings, especially those of frame construction, were erected with little attention to the possibility of heat losses, and the opportunities for saving fuel are so great that almost any expenditure within reason can be justified, provided they must be heated.

Obviously, the health and comfort of the employees who must work in the building should be given consideration, and the larger the number the easier it usually is to justify the application of insulation. A building that is overheated during hot weather and that cannot be kept at a comfortable temperature during cold weather, will not be conducive to satisfactory work on the part of those who occupy it. Furthermore, conditions of this sort are always responsible for considerable sickness, usually with loss of time, a large part of which is a burden on the employer. This, however, is one of the items

that are not susceptible of exact determination. Goodwill is also an asset that cannot be measured. If the building is one that is used by the public, it may be worth while to apply insulation and install air conditioning to develop good-will, regardless of other considerations although the returns are wholly intangible.

Obviously, the cost of applying insulation to the building will be im-

portant. Normally, this can be done at less cost while major repairs are under way. In any event, experience has shown that in most instances the savings in heating costs are so great that the cost of making the improvement can be wiped out in a remarkably short time. In addition, if a new heating plant is to be installed, less capacity will be needed and this investment will be reduced accordingly.

Group Vs. Spot Renewals

What considerations determine whether ties shall be renewed by the group or spot method? What is the importance of each?

A Combination Is Best

By C. D. TURLEY
Chief Tie Inspector, Illinois Central,
Chicago

A combination of the group and the spot methods of crosstie renewals will result in more uniform and satisfactory track conditions and in a longer and more effective service life of the crossties than will be obtained by a strict adherence to either plan. In other words, a yearly renewal program is desirable because it insures a higher standard of tie maintenance, keeps the general tie conditions more uniform, permits the ultimate life to be obtained from every individual tie, and provides better track support, so that general, out-of-face track surfacing needs to be done less frequently. I do not believe that it is either economical or desirable to defer the renewal of ties beyond their normal life.

Obviously, it costs less per tie to make replacements while the track is being surfaced out of face, and for this reason the group renewal plan of replacing all ties that do not have two or more years' service life remaining should be followed. Where general track conditions do not justify surfacing out of face, the spot method of renewing only those ties that are showing definite signs of failure should be followed.

In determining whether the track should be surfaced out of face or simply jointed and lined, several things should be given careful consideration, in addition to the number of ties that are in need of renewal. If line and surface are quite irregular, a condition that may spring from either a soft roadbed, a poor quality of ballast, poor drainage, defective ties or centerbound track, it will be more economical and more satisfac-

tory results will be obtained by surfacing the track out of face. In fact, if the track is centerbound, that in itself is ample evidence that it needs a general raise.

On the other hand, where general track conditions are good and only minor repairs are necessary, slight irregularities in line and surface should be corrected and any ties needing renewal should be replaced by the spot method. If proper care is exercised in tamping, and later in retamping, these ties no ill effects should result with respect to the riding conditions of the track.

Never Has Been Settled

By SUPERVISOR OF TRACK

This is a question of long standing which has been the subject of much discussion, but which apparently is no nearer settlement today than it has been for some years. The reasons for this are that both methods have disadvantages as well as advantages and, generally, the conditions that make one of these methods particularly desirable in one situation may differ in important respects from those which make the other method equally desirable in some other situation; yet to a considerable extent these conditions may overlap or, in other words, some of them may be common to both situations.

Where generous renewals have been made in connection with a general surfacing, the track should remain undisturbed for at least two, and sometimes three, years, except for spot surfacing where minor weak spots develop, because all ties will, or should, have a uniform bearing. This tends to prolong tie life, for in not a few instances tamping may be as destructive to tie life as the wear

and tear of traffic, especially where modern safeguards have been installed to prevent mechanical destruction at the top of the tie.

Where the group method of renewals is followed, assuming that renewals have not been restricted unreasonably prior to the general surfacing, some ties with remaining service life will be removed, and this argument is frequently used against the practice. However, any serviceable ties can easily be used to replace failed ties in unimportant tracks or if, say, only one year of tie life remains, they will almost invariably make good fence posts, lasting much longer than any untreated posts one is likely to get today.

Group Method Exceptional

By SUPERVISOR OF TRACK

In the past, when untreated ties were the rule rather than the exception, the group method of replacing ties had far greater merit than can be attributed to it today. Even when as many as one-third to one-half of our ties were receiving treatment this was also true, particularly as at that time tie treatment extended the service life to only about 12 to 15 years. I have maintained track that required normally from 300 to 600 ties a year, depending on the species of timber that was being cut and used locally on a particular line or section of line. Even when the treatment was good for as much as 15 years, renewals seldom dropped below about 300 to the mile annually. When they amounted to such figures as these, and it has not been so long since they did, they represented an average of about two to four ties to a rail length, although obviously they were not distributed so evenly.

With renewals of this magnitude the track support was disturbed to such an extent that much surfacing was required following the insertion of the ties, until conditions were again stabilized, usually late in the fall. As a consequence, general surfacing was called for at relatively frequent intervals and the group method of renewals followed logically, including the practice of replacing all ties that had no more than two years of life remaining, and this was generally stretched to three where rail was being laid. There was, and still is, economic justification for this practice, for by removing those ties that were approaching closely the end of their service life, as well as those that had failed, it became unnecessary to do more than routine spot surfacing and lining for

the succeeding two or three years, and the money thus saved easily balanced the value represented by loss in tie life.

Today, with treated ties representing approximately 88 per cent of those being inserted currently, and with relatively few of the untreated ties going into main tracks, together with the service life of a large percentage of the treated ties now in use extending up to 30 or more years, the entire situation has changed. During the five-year period ending with 1941, the average annual renewal on 79 Class I railways were less than

one tie to a 33-ft. rail; during this same period the average annual renewals on 61 of these roads was less than one tie to a 39-ft. rail; and 37 of them renewed less than 100 ties to the mile, while the minimum average number was 37 ties per mile per year. Under these conditions, little can be said in favor of group renewals as a general practice. There are plenty of places remaining, however, where this method can be employed to advantage, and I would not hesitate to employ it where I believed that it was physically and economically feasible to do so.

Conserving Paint Brushes

Since the supply of bristles has been shut off, what measures can be employed to conserve the paint brushes now on hand?

Do Not Wet Them

By L. G. BYRD

Supervisor of Bridges and Buildings, Missouri Pacific, Poplar Bluff, Mo.

It has been said truthfully that more brushes have been destroyed by improper care after they have been put into service than have ever worn out. However, no discussion of the conservation of brushes would be complete unless it refers to the care that should be given them while in stock prior to issue. Improvements in the methods and materials for setting the bristles have lessened the liability of damage, but reasonable care is still needed to prevent the drying out of the bristles without removal of all paint, and damage by moths, for moths will attack the bristles the same as they will a wool garment.

Strange to say, painters themselves are persistent offenders with respect to neglecting to give brushes the care that good workmanship and their cost demands. It has been often noted that many painters tend to wear out their brushes, rather than to use paint. In other words, they make many useless strokes after the paint has left the brush and has already been spread.

None of us has ever seen the time when intensive effort to preserve the bristles and thus conserve our brushes, has been more necessary than now, for when the present supply of brushes is exhausted, there will be no more. To this end, one should never immerse or leave a paint or varnish brush in water, either before or after it has been

placed in service. Water softens and swells the bristles, and will spoil the best as well as the poorest grades. On the other hand, oval brushes that show a tendency toward looseness can be tightened by pouring a little water on the butt of the handle, in the center of the brush, allowing it to be absorbed by the butts of the bristles. Water should never be allowed in contact with the bristles elsewhere, however.

Brushes can be cleaned without damage by holding them in a light flow of steam, following which they should be soaked in turpentine or benzine and then washed with soap and warm water. The bristles must be straightened, and a coarse comb is handy for doing this. When they have dried thoroughly they should be wrapped carefully in moisture-proof paper before being put away.

A brush has value only to the extent of the resilience of its bristles, for once they become soft and flabby its usefulness is over. Brushes left immersed in water become soft and flabby. When a brush is to be used on successive days, it should be suspended, with the bristles immersed in raw linseed oil, but hanging free of the bottom of the container. Varnish brushes should be treated in the same way in a separate container, and then washed out thoroughly in some paint solvent, such as turpentine or leptyne, before being dipped into varnish again.

Calcimine and whitewash brushes should be washed thoroughly and hung to dry with the bristles down. They should not be reused until they have dried thoroughly; otherwise they will be flabby and lifeless.

Flowing brushes should be suspended in varnish free from the bottom of the container; color brushes in turpentine, in a dust-proof container; lettering and striping brushes are best kept by cleaning them and flattening them out in a non-drying oil on a piece of glass. Naphthalene is an excellent preventive for moths, and should be used freely on all brushes that are put away for any extended period.

They Cannot Be Replaced

By GENERAL INSPECTOR OF BUILDINGS

Paint brushes of quality have always been made of hog bristles, practically all of which in recent years have been imported from China. Bristles from our domestic hogs are not only below the quality demanded for good brushes, but are too short to be of value. With the beginning of the war, the importation of bristles was shut off, and the government has removed the supply on hand from civilian channels, including all brushes containing bristles longer than 3 in., that is, 2 $\frac{3}{4}$ in. out of the ferrule.

In this situation only one course is open; this is to conserve the brushes on hand to the fullest extent possible. This can be done, in part, by closer supervision of the men in the gang to insure that they do not work the brushes unnecessarily over the surface after the paint is out of the bristles. Again, even the best of brushes will not last if they are employed for finish, body and priming coats; or with flat paints and enamels; and on rough as well as smooth surfaces.

Supervision is also needed to insure that brushes are cleaned thoroughly after use. Hard pigment tends to accumulate at the heel or butt of the bristles, especially when painting overhead surfaces or areas above the painter's shoulders. It is surprisingly difficult to remove this caked pigment, which has the effect of shortening the bristles by an amount equal to the depth of the accumulation.

After the daily cleaning, the brush should be allowed to dry overnight by being hung with the bristles down. It should not be kept submerged in linseed oil or turpentine as is sometimes recommended. If allowed to dry in this manner the bristles will last longer, while a brush that has been kept submerged in either oil or turpentine tends to leak over the ferrule, particularly when used on overhead work. If the brush is to be put away for a time,

the bristles will last longer if they are filled with linseed-oil soap lather and then wrapped in waterproof paper, after being combed out flat. Calcimine brushes should be washed out in warm water at the end of the day and hung with the bristles down to dry. Do not wet other brushes, except as will be explained.

If a brush has been neglected and

is caked hard, it can be cleaned in a solution of tri-sodium phosphate. After the paint has been softened and removed, a heavy lather of laundry soap should be worked into the bristles until all evidence of paint has been removed. It should then be rinsed thoroughly in warm water and hung up to dry, and should not be used until it is dry.

Finger-Free Fit for Nuts

What are the advantages of a finger-free fit for nuts on track bolts, compared with a wrench fit? The disadvantages?

Favors Finger-Free Fit

By DISTRICT ENGINEER

I am glad that this question has been raised for I believe that it is worthy of wide discussion. I have always been an advocate of the finger-free fit for the nuts on track bolts, for to my mind they are the most logical design. However, it is not practical to employ them without a spring washer of high reactance. Unfortunately, until the last few years, spring washers were neither reliable nor of high reactance. This situation induced the use of tightly-fitting threads, generally designated as a wrench fit, for nuts on track bolts, so that the nuts would not work off, even if they became loose.

With the advent of the high-reactance spring washer, a new situation developed. Where they are used, the danger that a loose or finger-fitting nut will back off the bolt is eliminated for, once tightened, it does not tend to get loose quickly as any nut did with the unreliable nut lock. If the nuts are not kept tight, however, they will work loose and back off quickly. This is particularly noticeable with new rail for, no matter how tightly the bolts are drawn when the rail is being laid, the adjustments that occur as the joint bars settle into place, release much of the tension in the bolts, and there can be no argument about the time when they should be retightened.

I consider this characteristic of the finger-free fit a valuable asset, for where nuts of this type are applied, the bolts must be kept tight, an essential requirement for a high standard of track maintenance. Other advantages are that the nuts do not freeze on the bolts but can be tightened or removed with relative ease; when a nut is run up on a bolt, the threads are not distorted or other-

wise damaged, unless it is drawn up so tight as to strip them; while I have no data to back up this belief, it stands to reason that uniform tension in the bolts can be obtained more easily with free-running nuts than with nuts that require pulls up to 90 lb., with a 15- or 24-in. lever arm, just to twist them onto the bolt.

Have Numerous Advantages

By H. H. HARMAN

Engineer of Track, Bessemer & Lake Erie, Greenville, Pa.

Nuts for track bolts designed with a finger-free fit are better than wrench-fit nuts for the following reasons:

They make successful thread contact between the nut and the bolt for the entire thickness of the nut.

There is better distribution of the load on the bolt, between the bolt and the nut.

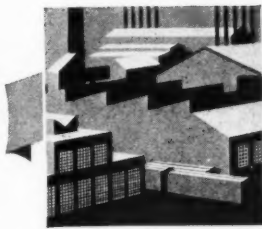
It is possible to tell when the nut is going on in good shape, which is not true with the wrench-fit nut. With the wrench-fit nut, the threads on both the bolt and the nut are often damaged, and the damage is not discovered until later.

Finger-free nuts do not freeze on the bolts so that it becomes impossible to tighten or remove them.

It is possible to get a more uniform bolt tension with finger-free fit than with wrench-fit nuts.

Finger-free nuts can be applied or removed more easily and more quickly than those with a wrench fit.

The only objection to finger-free nuts, which might be raised in some quarters, is that a substantial spring washer is required with them. We do not consider this a disadvantage, however, because we believe that a spring washer is desirable and should be used on all track bolts.



PRODUCTS of Manufacturers

Portable Floodlights

THE National Carbide Corporation, New York, has brought out a new line of portable floodlights which incorporate a number of improved features as compared with lights formerly manufactured by this company. Designed to provide adequate lighting for either routine or emergency work, the new floodlights are available in units ranging from 1,500 to 16,000 candlepower.

A feature of the new floodlights is that they are provided with transparent carbide hoppers made of Pyrex glass, thus enabling the operator to determine the approximate amount of carbide left in a light at any time. Another advantageous feature of the lights is that they are so designed and constructed that many of the parts are interchangeable, not only between units of the same model, but also between different models.

The new line of floodlights contains four models, designated as NC-100, NC-200, NC-199 and NC-299. Models NC-100 and NC-200 both use generators having a capacity of 7 lb. of carbide and 7 gal. of water. These units are similar except that, whereas Model NC-100 has a single 13-in. reflector giving a light of 8,000 candlepower, Model NC-200 has two 8,000-candlepower reflectors which are

mounted on swinging joints, permitting directional control of one or both lights. These models will operate one light for 12 hr. or two lights for 6 hr. on a single charge.

Models NC-199 and NC-299, having generators carrying $1\frac{3}{4}$ lb. of carbide and 2 gal. of water, were developed for emergency work requiring shorter periods of use and lighter-weight units. The first named of these models uses an 8-in. reflector, delivers approximately 1,500 candlepower, and is said to operate for more than 5 hr. on a single charge. Model NC-299 is equipped with a 13-in. reflector, mounted on a swinging joint, and delivers 8,000 candlepower. This unit will operate three hours on a charge.

Low-Priority Welding Rods

AIR Reduction Sales Company, New York, is marketing two new types of hard-facing welding rods which are available under the regular A-10, P-100 priorities ratings, known as the Stoodite K and Stoodly Self-Hardening K. Stoodite K is a cast hard-facing rod consisting principally of molybdenum, tungsten, manganese, silicon, carbon, and iron. Deposits of Stoodite K average 54-58 on the Rockwell C scale, depending on the type of parent metal and the method of application. It is supplied both in bare form for oxy-acetylene application and in coated form for D. C. electric application in five rod sizes: $\frac{1}{8}$ in., $\frac{3}{16}$ in., $\frac{1}{4}$ in., $\frac{5}{16}$ in. and $\frac{3}{8}$ in., and in rod lengths of 14 in. Stoodite K is recommended for hard-facing various types of tools and parts of equipment subject to abrasive wear.

Stoodly Self-Hardening K is composed principally of molybdenum, manganese, silicon, carbon, vanadium, and iron, and is made in the form of tubes with the mixed alloys on the inside. Deposits of Stoodly Self-Hardening K average 50-54 on the Rockwell C scale, depending on the type of parent metal and the method of application. It is supplied bare for oxy-acetylene application and bare and coated for D. C. electric application and is available in three rod

sizes, $\frac{1}{8}$ in., $\frac{3}{16}$ in. and $\frac{1}{4}$ in. The electric rods are 14 in. and the acetylene rods 28 in. in length. Stoodly Self-Hardening K can be used for hard-facing various types of manganese equipment. Deposits of this rod can be forged if the forging is done at red heat. It is recommended for hard-facing equipment subjected to both severe wear and impact.

Johns-Manville Sealing Compounds

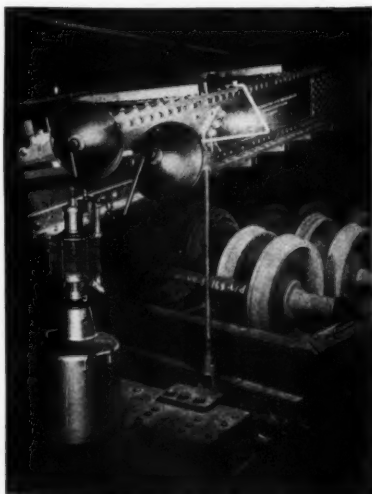
DUXSEAL and three other specialized non-hardening adhesive sealing and caulking compounds suitable for a wide range of uses, such as caulking around steel window frames or plumbing fixtures, filling cracks in brick work, etc., have been developed by Johns-Manville. Used like putty, just as it comes from the package, Duxseal is said to stick readily to any clean surface without slumping, flowing, or hardening in service. It is insoluble in water, unaffected by ordinary gases and condensates, and will not hurt the hands.

Duxseal was originally developed for electric power and telephone companies to seal openings in ducts carrying electrical conductors. Its usefulness, however, led to its adoption for general utility service. It is black in color and weighs 100-lb. per cu. ft. It is furnished in 1-lb. and 5-lb. pugs, in cartons of 60 and 12 pugs, respectively.

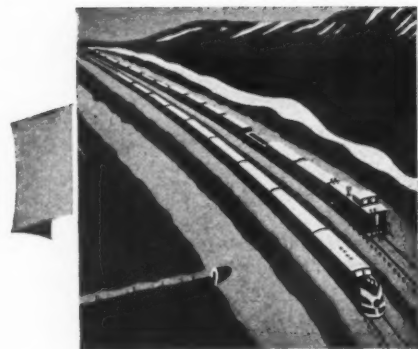
Three additional sealing compounds, Pakseal, Tranalseal and Nodrseal, similar in appearance and general characteristics, but differing in consistency and certain individual properties, have also been added. Pakseal is similar to Duxseal except that the body tends to "jell" in service while the outer surface hardens slowly. It may be used for all purposes where greater stiffness and rigidity is required than can be obtained with Duxseal. Pakseal has a slight injurious effect on rubber compounds.

Tranalseal has approximately the same "body" and general characteristics as Duxseal except that it is more impervious to refined oils. This property, plus the fact that it will not harm rubber or lead, adapts it particularly for sealing where the use of oil is involved.

Nodrseal is a non-hardening, adhesive plastic compound specially designed for use as a sealing compound in food storage spaces, refrigerators, etc. It is odorless and provides a highly effective seal against water-vapor, fumes and most ordinary gases and condensates.



This View Shows a Model NC-200 Floodlight in Use on a Wrecking Train



NEWS

of the Month

Oil Movement Increases to 788,550 Barrels

A new record was set when the average daily tank car movement of oil to the east coast increased to 788,550 barrels during the week ended July 11, an increase of 56,790 barrels daily more than the previous record made in the week ended June 20. In handling the movement, 32 oil companies loaded 26,285 cars and, including cars returning west for reloading, it is estimated that 62,000 tank cars were used for this traffic.

Minimum Rail Pensions of \$50 a Month Proposed

Liberalization of Railroad Retirement Act benefits to provide minimum annuities and pensions of \$50 a month for persons with 30 years service, retiring at 65 years of age or on account of total disability is proposed in a bill which has been introduced by Representative Van Zandt, Republican of Pennsylvania. Under the bill, the annual cost, amounting to \$4,620,000, would be borne by the federal government without increased taxes on railroads or their employees.

Southern Pacific Again Asks to Import Mexican Laborers

The Southern Pacific Company has petitioned Washington authorities for permission to import Mexican track workers, temporarily, to fill vital labor shortages. A similar request was refused by the Immigration Bureau of the Department of Justice in September, 1941. Recently the Southern Pacific has attempted to secure laborers from the ranks of unemployed negroes in Southern states, many of whom accepted free transportation to points in New Mexico, Arizona and California and then sought other employment. The railroad has recently agreed to return more than 1,000 sick and minor negroes who, as a result, became stranded in California.

Rails Have Perfect Record Handling Explosives in 1941

In the transportation by rail of explosives of all kinds in the United States and Canada in 1941, there were no explosions, no fires, no deaths and no injuries, according to the annual report of the Bureau of Explosives of the Association of American Railroads.

During the year there were 51 situations classed by the Bureau as "near accidents," any of which might have resulted in a

serious explosion. Of these, 15 were attributed to rough handling, train accidents, or other conditions for which the carriers were responsible, while shippers were said to be at fault in other cases.

Priorities on Rail Travel May Be Necessary—Eastman

Joseph B. Eastman, Director of Defense Transportation, recently told a Senate appropriations subcommittee that passenger travel on the average is 50 per cent over what it was last year and that "the prospects on rail travel are none too good. If it comes to actual control over passenger travel, it is a little difficult to know just what we can do. I have no power to say that county fairs shall not be held or that race tracks shall not be run. I have control over transportation. Probably the first thing to do would be what has been done in the case of air traffic, and say that certain people have priorities and they shall have the first opportunity. Then you can carry that down the line pretty far. How far you can carry it is a question on which members of my staff are now differing. If you get down to the rationing of our transportation, it would probably mean putting it all on a reserved-seat basis and creating a great organization to handle it."

WPB Seizes Rail and Scrap from Branch Lines

As the result of meetings in various sections of the country between railroad executives and representatives of the Railroad Salvage Section of the War Production Board early in July, the railroads have agreed to submit to the broader use of the war power of the government to seize property, and allow WPB to requisition scrap and rail required by the Army and Navy and from branch lines. Several lines have already been requisitioned.

One of the first of such lines to be requisitioned by WPB was a 102-mile line of the Chicago & North Western between Hastings, Neb., and Linwood. The abandonment of this line has been authorized by the Interstate Commerce Commission but was opposed by the Nebraska State Railway Commission. Dismantling is expected to begin the latter part of August as soon as the grain in the elevators along the line can be moved. About a week later, WPB requisitioned track and bridge material from a 57-mile branch line of the Illinois Central between Red Oak, Ill., and Dodgeville, Wis., and the operation

on that line ceased on July 25. It has also been reported that WPB has requisitioned the material from a 91-mile line of the St. Louis-San Francisco between Fayetteville, Ark., and Ft. Gibson, Okla., which was scheduled for an application for abandonment before the I.C.C. on July 20.

Priorities and Prices

As reported in the July issue, the railroads have been given a new A-1-j rating for materials essential for repair and maintenance of track, structures, signal and communication systems, cars and locomotives and other important operating equipment and that the ratings under the order may be applied without further authority for installations in which the charge to capital account is not in excess of \$500 for a single project. Important exceptions to this restriction are given in paragraph (a) (7) of Preference Rating Order No. P-88 as follows:

(a) (7) The terms "Maintenance," "Repair" and "Operating Supplies" do not include:

(1) the use of Material for the improvement of the Railroad's property or equipment through the replacement of material in the existing installation with material involving the use of greater quantities of critical material, *except in the following cases:* (a) In renewing rail, the weight of rail and type of fastenings conforming to the Railroad's standard practice may be used; (b) In repairing equipment, parts of an obsolete type may be replaced with parts conforming to the Railroad's standard practice; (c) In installing safety appliances in locomotives, passenger and freight cars under orders of Federal or State regulatory bodies; (d) Where specific authority is given by the director of Industry Operations.

War Department Surveying Railroad to Alaska

On July 4, the War Department revealed that a survey of a proposed near-coastal railroad to Alaska has been underway since early spring, which would supplement the inland Trans-Canadian highway now under construction and provide four means of access (sea, air, highway and railroad) to Alaska.

The survey follows the "B" route proposed by the Alaskan International Highway Commission, "in an almost straight line up the Rocky Mountain trench." The route was chosen, the War Department statement said, because it is the "shortest possible" direct route—1,300 miles—between Prince George and the Alaska railroad; and because it lies in the trench between the Coast Range and the Rocky Mountains, making the winters relatively moderate. Also, "it offers fewer construction difficulties than alternate routes." Four hundred miles have already been surveyed and located.

Association News

Bridge and Building Supply Men's Association

President R. Y. Barham has called a meeting of the officers and directors of the association, to be held in Chicago on August 10, to consider plans for an exhibit of bridge and building equipment and materials in conjunction with the annual convention of the American Railway Bridge and Building Association at the Hotel Sherman, Chicago, on October 20-22.

Maintenance of Way Club of Chicago

Looking ahead to one of the most constructive seasons in its history, in the interest of affording maintenance men in the Chicago area an open forum for the discussion of their current problems, the Executive committee of the club will meet in Chicago early in August to make plans for its meetings ahead, and especially for its first fall meeting, which will be held on October 25.

V. G. Walling, division superintendent, Chicago Surface Lines, and second vice-president of the club, has resigned, having been appointed a lieutenant in the United States Navy, assuming his duties at once.

Wood-Preservers' Association

W. J. Burton, assistant to chief engineer, Missouri Pacific, has been appointed chairman of the association's Committee on Tie Service Records, replacing C. D. Turley, chief tie inspector, Illinois Central, at his request. One of the most important functions of the committee this year will be to inaugurate changes in the frequency and form of publishing its tie service records to make them of greatest value to users.

Announcement has also been made of the personnel of the association's Committee on Southern Pine Piles—Pressure Treatment, of which, R. H. Mansfield, southern general superintendent, American Creosoting Company, is chairman.

Track Supply Association

Following the example of the Roadmasters' Association, the officers and directors of the Track Supply Association met in Chicago on July 27, and changed the headquarters for its annual exhibit, to be held in Chicago, September 14-17, from the Hotel Stevens to the Hotel Sherman. This action was occasioned by the government's taking over the Hotel Stevens as an army radio training school, effective August 1. New charts of the exhibit hall in the Sherman were mailed to exhibitors on July 24, and assignments of booth locations will be made as soon after August 3 as possible.

With railway supply manufacturers anxious to render every possible service to the track maintenance forces in the light of their many new war-time problems, 40 companies have already arranged for 59 booths at the exhibit, several of them enlarging their space beyond that of

recent years to show new products and new products applications. In addition to the firms listed in the July issue as having reserved space, A. P. deSanno & Son, Inc., Phoenixville, Pa., and the U. S. Wind Engine & Pump Co., Batavia, Ill., have taken space. Several other companies are completing arrangements to exhibit, delayed only by the change in the exhibit headquarters. Further applications should be addressed to Lewis Thomas, secretary, The Q. & C. Company, 59 E. Van Buren street, Chicago.

Roadmaster's Association

The headquarters of the annual meeting of the association, to be held in Chicago, September 15-17, have been changed from the Stevens Hotel, where the meeting has been held for a number of years in the past, to the Hotel Sherman. Action in this regard was taken by the Executive committee of the association, which met in Chicago on July 20, following announcement that the United States government is taking over the Stevens Hotel for an army radio training school, effective August 1. Highly satisfactory convention facilities are available at the Sherman, and will insure a highly satisfactory convention from this standpoint.

Numerous matters of association interest were acted upon at the meeting of the Executive committee, which was attended by President A. B. Hillman; First Vice-President E. L. Banion; Second Vice-President H. E. Kirby; Secretary A. G. Shaver; Director J. J. Miller; Past President Elmer T. Howson; and R. Marshall, a committee chairman. R. M. Blackburn and Lewis Thomas, president and secretary, respectively, of the Track Supply Association, also attended the meeting.

After acting favorably upon the change in convention headquarters, the committee reviewed the finances and membership of the association, and then gave detailed attention to the preparation of a program for its convention, looking to the formulation of a program that will, to the largest possible extent, meet the needs of supervisory track officers under present emergency war conditions. In addition, the committee reviewed in detail a number of the committee reports to be presented at the convention.

American Railway Engineering Association

Five committees of the association held meetings during July, as follows: Waterproofing, at Chicago, on July 8; Iron and Steel Structures, at Cleveland, Ohio, on July 9-10; Maintenance of Way Work Equipment, at Richmond, Va., on July 16-17; Economics of Railway Labor, at Chi-

cago, on July 21; and Masonry, at New York, on July 28-29. Only one committee has thus far scheduled a meeting during August, this being the Committee on Buildings, which will meet at Cincinnati, Ohio, on August 4, to give primary consideration to substitutes for critical building materials.

Early in July, members received the June-July bulletin of the association, No. 432, features of which include the preliminary report of the Committee on Ties, containing statistics relative to 1941 tie renewals; a joint paper by G. M. Magee and E. E. Cress, research engineer and assistant engineer of tests, respectively, of the Engineering division, A.A.R.; and a statement by Secretary Lacher detailing the emergency measures adopted by the association to enable it to deal most effectively with the problems confronting engineering and maintenance men as the result of the war.

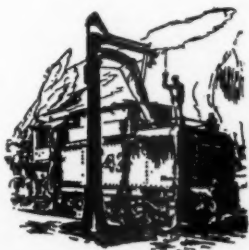
In line with certain of the measures pointed out in Secretary Lacher's statement, a letter was sent to the chief engineering officers of member roads during the month, presenting Emergency Provisions, effective for the duration of the war, modifying the recommended A.R.E.A. designs for tie plates for 112-lb. and 130-lb. rail—the object of these provisions being to expedite manufacture through simplification and standardization.

Bridge and Building Association

As a result of a government order taking over the Hotel Stevens, Chicago, effective August 1, for an army radio training school, the association has changed the headquarters and date of its 1942 annual meeting—which will now be held at the Hotel Sherman, Chicago, October 20-22. Action in this regard was taken at a meeting of the Executive committee in Chicago on July 27, which was attended by President R. E. Dove; First Vice-President F. H. Soothill; Third Vice-President A. M. Knowles; Fourth Vice-President N. D. Howard; Secretary A. G. Shaver; Treasurer F. E. Weise; Directors J. L. Varker and Martin Meyer; Past Presidents H. M. Church, A. E. Bechtelheimer, C. M. Burpee and Elmer T. Howson; and Committee chairmen F. G. Campbell, A. R. Harris, W. A. Huckstep and J. P. Hanley.

The principal matters given consideration at the meeting of the Executive committee had to do with plans for the coming convention, looking toward making this a most intensive meeting in the interest of meeting the special problems of bridge, building and water service men arising out of the nation's war effort. The Program committee of the association presented a tentative program to this end and was instructed to complete details in connection therewith. Other action of the committee included the acceptance of eight applications for membership, and a detailed review of all eight tentative reports prepared by committees for presentation at the convention.

The 1941 Proceedings of the association, covering in full the activities at its last convention, were completed and distributed to members during July. A review of the Proceedings appears elsewhere in this issue.



Personal Mention

General

J. W. Treadwell, division engineer on the Missouri Pacific at Poplar Bluff, Mo., has been promoted to assistant superintendent at Pueblo, Colo.

W. W. Morrison, chief engineer of the Pittsburg & Shawmut, with headquarters at Kittanning, Pa., has also been elected general superintendent of the company.

John D. Farrington, chief operating officer of the Chicago, Rock Island & Pacific, and a maintenance officer by training and experience, has been promoted to chief executive officer with headquarters as before at Chicago, succeeding **Edward M. Durham, Jr.**, also an engineer by training and experience, who has retired. **William H. Hillis**, assistant chief operating officer in charge of engineering and maintenance of way, with headquarters at Chicago, has been promoted to operating officer, with the same headquarters, succeeding to the duties of Mr. Farrington.

Mr. Farrington was born at St. Paul, Minn., on January 27, 1891, and attended St. Paul Academy (St. Paul, Minn.). He entered railway service in the engineering department of the Great Northern in June, 1909, and went with the Chicago, Burlington & Quincy in 1910 as a time-keeper, later serving successively as assistant foreman, foreman and roadmaster in the track department. After being transferred to the operating department, he served as assistant trainmaster, trainmaster and assistant superintendent. From 1917 to 1919, he served in the United States Army as lieutenant, captain and major. Following the war he returned to railroad service as superintendent of the Quincy, Omaha & Kansas City (part of the Burlington), and then served successively on the Burlington as superintendent at St. Joseph, Mo., and Aurora,



John D. Farrington

Ill., general superintendent of the Missouri district, and general superintendent of both the Missouri and Iowa districts. In October, 1931, he was promoted to general manager of the Ft. Worth & Denver City and the Wichita Valley with

headquarters at Ft. Worth, Tex., which position he held until May 15, 1936, when he went with the Rock Island as chief operating officer.

Mr. Durham was born in Memphis, Tenn., on October 23, 1875, and graduated in civil engineering from Lehigh university in 1898. In 1896-97 he was engaged with the United States War Department on hydrographic surveys on the Ouachita river, following which he served for several years as recorder for the Deep Waterways Commission of the State of New York. He entered railway service in 1899 as a transitman on the Chicago & North Western, and in the following year went with the Southern as an assistant engineer, later being advanced successively to resident engineer, principal assistant engineer, assistant chief engineer, and chief engineer. While connected with the Southern, he also served for two years as valuation engineer of the Atlanta, Birmingham & Atlantic (now the Atlanta, Birmingham & Coast) and as executive general agent of the Southern. In 1920 Mr. Durham joined the United States Railroad Administration as manager of

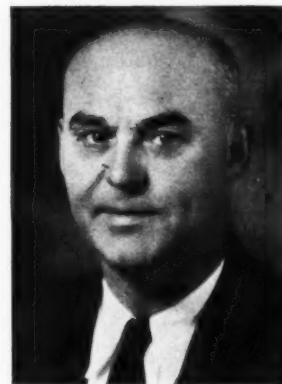


Edward M. Durham, Jr.

the department of way and structures, being appointed director of the division of liquidation claims in 1923. He returned to railway service in 1924 as assistant to the president of the Missouri Pacific, and was made vice-president in 1926 and senior vice-president in the following year, which position he held until December, 1935, when he was made chief executive officer of the Rock Island.

Mr. Hillis was born at Colona, Ill., on March 31, 1886, and entered railway service on January 1, 1906, as a rodman on the Chicago, Burlington & Quincy at Beardstown, Ill. He later served in various capacities in the engineering department of that railway until August 15, 1911, when he was appointed a roadmaster, and during the following five years, served in that position on various divisions, then being transferred to the operating department as trainmaster on the Aurora division. In 1925, Mr. Hillis was appointed district engineer of maintenance of the Illinois district with headquarters at Galesburg, Ill., and in October, 1927, he was advanced to assistant superintendent of the LaCrosse division. Three years later, he was transferred to the Galesburg division, and on December 15, 1931, he

was sent to Texas as superintendent of the construction of a 110-mile line between Childress, Tex., and Pampa. He then returned to the LaCrosse division as assistant superintendent. In July, 1936,



William H. Hillis

Mr. Hillis went with the Rock Island as engineer maintenance of way, and in October, 1939, he was promoted to assistant chief operating officer.

Edward C. Gegenheimer, superintendent of the Philadelphia Terminal division of the Pennsylvania, and an engineer by training and experience, has been promoted to general superintendent of the Central Pennsylvania division, with headquarters at Williamsport, Pa. Mr. Gegenheimer was born at Chicago on August 28, 1893, and attended Armour and Lewis institutes in Chicago. He entered railway service on November 13, 1911, as an assistant on the engineer corps of the Pennsylvania, subsequently engaging in the construction of the Chicago Union station and later becoming assistant general yardmaster and assistant engineer in the chief engineer's office at Chicago. He was appointed assistant trainmaster on the Columbus division on May 1, 1927, later being transferred to the Toledo division. Mr. Gegenheimer then served successively as trainmaster on the Philadelphia Terminal division and trainmaster on the Akron division. On June 1, 1931, he was promoted to superintendent of the Sunbury division, then being transferred successively to the Toledo, Williamsport, Middle, and Philadelphia Terminal divisions.

Mark C. Williams, general superintendent on the Union Pacific at Portland, Ore., and an engineer by training and experience, has been promoted to general manager of the Northwestern district, with the same headquarters. Mr. Williams was born at Delaware, Ohio, on August 29, 1882, and studied civil engineering from 1903 to 1906 at the University of Denver and the University of Colorado. He entered railroad service in 1901 as a rodman on surveys for the Denver & Salt Lake. In October, 1906, he became a draftsman for the Oregon-Washington Railroad & Navigation Co. (now part of the Union Pacific) and was later advanced successively to transitman, locating engineer and resident engineer on location and construction work. On Feb-

ruary 1, 1914, he was promoted to division engineer, with headquarters at Walla Walla, Wash., and on June 1, 1917, he was transferred to Portland. In August, 1927, Mr. Williams was appointed acting superintendent, with headquarters at Spokane, Wash., and on December 1, 1927, he was promoted to superintendent at that point, later being transferred to Portland. In August, 1941, he was advanced to general superintendent.

George C. Jefferis, assistant to the operating vice-president of the Atchison, Topeka & Santa Fe, with headquarters at Chicago, and an engineer by training and experience, has been promoted to general manager of the Western lines, with headquarters at Amarillo, Tex. Mr. Jefferis was born in Philadelphia, Pa., on September 27, 1889, and entered railway service on December 4, 1903, as a telegraph operator on the Pennsylvania. On March 28, 1911, he went with the Santa Fe as a chainman at Amarillo, and later served as a rodman, transitman, draftsman, assistant extra gang foreman and an extra gang foreman at various places in Texas and New Mexico. In August, 1916, Mr. Jefferis was promoted to roadmaster, with headquarters at Plainview, Tex., and on June 16, 1917, he was further advanced to division engineer, with headquarters at Clovis, N. M. In February, 1924, he was promoted to assistant superintendent of the Middle division and then served successively as superintendent of the Slaton division, superintendent of the Oklahoma division, and assistant general manager of the Northern district, Western lines, with



George C. Jefferis

headquarters at La Junta, Colo. Mr. Jefferis was promoted to assistant to vice-president, with headquarters at Chicago, on July 1, 1939, the position he held at the time of his recent promotion.

Engineering

F. R. Smith, engineer of bridges and buildings of the Union Railroad, with headquarters at East Pittsburgh, Pa., has been appointed assistant chief engineer in charge of bridges and buildings.

John P. Scully, general agent of the Maine Central at Lewiston, Me., has been promoted to division engineer of the Portland division, with headquarters at Portland, Me., succeeding **E. A. Johnson**, who is to be assigned other duties.

Carl Djuvik, supervisor of bridges and buildings of the Tennessee Central, with headquarters at Nashville, Tenn., has been promoted to engineer of bridges and buildings, effective July 16, with the same headquarters.

T. H. Gray, master carpenter of the Conemaugh division of the Pennsylvania, with headquarters at Pittsburgh, Pa., has been appointed assistant engineer in the office of the chief engineer maintenance of way of the Central region, with the same headquarters.

C. L. Stuckey, roadmaster on the Gulf Coast Lines (Missouri Pacific) at Beaumont, Tex., has been appointed assistant division engineer at De Quincy, La., succeeding **Clarence Baker**, whose promotion to principal assistant engineer, with headquarters at Houston, Tex., was reported in the June issue.

Carroll B. Porter, assistant division engineer on the Chesapeake & Ohio, with headquarters at Huntington, W. Va., has been promoted to division engineer with the same headquarters, succeeding **R. W. Mumford**, who has retired. **Gilbert D. Mayor**, supervisor of track, with headquarters at St. Albans, W. Va., has been promoted to assistant division engineer at Huntington to succeed Mr. Porter.

Mr. Porter was born on February 11, 1904, at Norfolk, Va., and attended the University of Cincinnati. He entered railway service in November, 1922, as a rodman on the Chesapeake & Ohio, being advanced to instrumentman in November, 1923. Six years later, Mr. Porter became resident engineer at Hinton, W. Va., being transferred to Talcot, W. Va., in April, 1930, and thence to Huntington in January, 1938. He was promoted to assistant division engineer at the latter point in September, 1940.

W. S. Fife, roadmaster on the New York, Chicago & St. Louis (Nickel Plate) at Ft. Wayne, Ind., has been promoted to assistant division engineer at that point, succeeding **R. L. Mays**, whose appointment as assistant supervisor of bridges and buildings of the Clover Leaf district, with headquarters at Frankfort, Ind., is reported elsewhere in these columns.

H. T. Bradley, valuation engineer of the Gulf Coast Lines and the International-Great Northern (Missouri Pacific), with headquarters at Houston, Tex., has been promoted to valuation engineer of the Missouri Pacific Lines, with headquarters at St. Louis, Mo., succeeding **H. C. Searls**, who retired on August 1. **H. M. Noel**, roadmaster on the Missouri Pacific at St. Louis, has been promoted to division engineer at Poplar Bluff, Mo., relieving **J. W. Treadwell**, promoted.

R. D. Pierson, division engineer on the Atchison, Topeka & Santa Fe at San Bernardino, Cal., has been promoted to regional engineer at Los Angeles, Cal., to succeed **F. D. Kinnie**, who has been promoted to chief engineer of the Eastern Lines at Topeka, Kan., as reported in the July issue, and **R. E. Chambers**, division engineer at Needles, Cal., has been transferred to San Bernardino, to succeed Mr. Pierson. **E. L. McDonald**, division engineer at Winslow, Ariz., has been transferred to Needles, succeeding Mr. Cham-

bers, and **W. B. Darling**, assistant division engineer at Winslow, has been appointed acting division engineer at that point, replacing Mr. McDonald. **Jack Morgan**, construction engineer, San Diego, Cal., has been appointed assistant division engineer at Winslow, relieving Mr. Darling.

Frank W. Thompson, engineer officer of the Chicago, Rock Island & Pacific, has been promoted to chief engineer, with headquarters as before at Chicago, a position that has been vacant since the



Frank W. Thompson

retirement of the late **Robert H. Ford** on September 30, 1939. Mr. Thompson was born at Silver Cliff, Colo., on January 26, 1881, and attended the University of Kansas for five years. He entered railway service on July 1, 1899, as a levelman on the Rock Island at Kansas City, Mo., returning to school that fall. On July 6, 1903, he was appointed draftsman and estimator on the Rock Island at Kansas City. During the next few years he served as draftsman, instrumentman and transitman at various points and on October 30, 1907, he was transferred to Chicago on office work and drafting. Mr. Thompson was promoted to assistant office engineer on August 2, 1908, and on December 17, 1909, he was appointed assistant engineer at Davenport, Iowa. On February 1, 1911, he was advanced to division engineer, with headquarters at Des Moines, Iowa, and on January 1, 1929, he was transferred to Rock Island, Ill. On October 1, 1939, Mr. Thompson was promoted to engineer officer, with headquarters at Chicago.

Charles W. Baldridge, whose retirement as assistant engineer in charge of rail and track fastenings on the staff of the chief engineer of the Atchison, Topeka & Santa Fe at Chicago, was reported in the July issue, was born in Woodford county, Ill., on April 18, 1869, and attended Baker University for 2½ years and the University of Kansas for three years, studying electrical and civil engineering. He entered railway service in 1893, serving about six months as a chainman on the Galveston, La Porte & Houston (now part of the Southern Pacific Lines in Texas and Louisiana) and in 1895 returned to railroad service as a levelman on the Kansas City, Watkins & Gulf (now part of the Missouri Pacific). In August, 1897, Mr. Baldridge went with the Santa

Fe as a chainman at Carrollton, Mo., and a month later, he was promoted to rodman at Ft. Madison, Iowa. In January, 1899, he was appointed a masonry inspector at Pueblo, Colo., and in March, 1899, he went with the Chicago, Burlington & Quincy as an assistant engineer on construction. He then served a year as an assistant engineer on maintenance on the Kansas City, Ft. Scott & Memphis (now part of the St. Louis-San Francisco) and in 1901 went with the Chicago & North Western in the same capacity. In 1903 he was promoted to roadmaster and served in that capacity at various points in Iowa and South Dakota. Mr. Baldridge then served for a year as superintendent of construction of the Saratoga & Encampment (now operated by the Union Pacific) in Wyoming and in 1911 he went with the Chicago, Rock Island & Pacific as roadmaster at Eldon, Iowa, later being transferred to Washington, Iowa. In May, 1912, he returned to the Santa Fe as an assistant engineer, with headquarters at Topeka, and in November, 1913, he was promoted to assistant engineer, system, with headquarters at Chicago, where he remained until his retirement. Mr. Baldridge has been an active member of the



Charles W. Baldridge

American Railway Engineering Association and was chairman of its Committee on Roadway from March, 1927, to March, 1933. He was president of the Roadmaster's and Maintenance of Way Association of America in 1934-1935.

G. N. Edmondson, engineer of track of the New York Central, lines Buffalo and East, has been promoted to engineer maintenance of way of the same lines, with headquarters as before at New York, to succeed **W. A. Murray**, who retired, effective June 30. **J. H. Kelly**, division engineer of the Electric division, with headquarters at New York, has been promoted to engineer of track, to succeed Mr. Edmondson, and **J. N. Grim**, division engineer of the Eastern division at New York, has been transferred to the Electric division, succeeding Mr. Kelly. **F. B. Wilcox**, supervisor of track, with headquarters at Batavia, N. Y., has been promoted to division engineer of the St. Lawrence, Adirondack and Ottawa divisions, with headquarters at Watertown, N. Y., succeeding **C. A. Maxeiner**, who has been transferred to the Eastern division, with

headquarters at New York, to succeed Mr. Grim. **C. C. Lathey**, assistant supervisor of track at Fonda, N. Y., has been appointed assistant engineer on the Electric division, with headquarters at New York, to succeed **Clarence M. Gregg**, whose appointment as supervisor of track is noted elsewhere in these columns.



G. N. Edmondson

Mr. Edmondson was born at New Haven, Conn., on August 22, 1879, and entered the service of the New York Central in July, 1901, in the engineering corps. From July, 1903, to November, 1905, he served as assistant supervisor of track and supervisor of track. He was assistant engineer and assistant engineer of track of the Hudson and New York divisions from November, 1905, to May, 1907, then becoming supervisor of track at West Albany, N. Y. In March, 1910, Mr. Edmondson was appointed assistant division engineer at Utica, N. Y., and was promoted to division engineer at Rochester, N. Y., in April, 1911, being transferred to Jersey Shore, Pa., in June, 1918, and to Albany, N. Y., in June, 1920. Mr. Edmondson was appointed engineer of track at New York in October, 1927, the position he held until his recent promotion.

Mr. Murray was born on June 5, 1876, at Montville, Me., attended Maine Cen-



W. A. Murray

tral Institute, Pittsfield, Me., and graduated from the University of Maine in 1899. Mr. Murray entered railroad service in 1900 in the maintenance of way

department of the New York Central, serving successively as assistant engineer, supervisor of track, division engineer, engineer of track and engineer maintenance of way.

Mr. Kelly was born at Fonda, N. Y., on August 9, 1891, and received his engineering education at Rensselaer Polytechnic Institute, Troy, N. Y. He entered railway service in the engineering corps of the division engineer of the New York Central at Albany, N. Y., in August, 1912. In 1913, he was appointed engineering assistant on Subdivision 6, between Schenectady, N. Y., and Herkimer, where he remained until August 24, 1917, when he obtained a leave of absence to enter the United States Army, later sailing for France as a lieutenant of artillery on January 10, 1918. Following active participation in the various drives of the American Expeditionary Forces, and after receiving several decorations and citations, he returned to this country on September 3, 1919, resuming the position of engineering assistant on October 12 of the same year. In 1923, Mr. Kelly was promoted to assistant division engineer at Utica, N. Y., and served in that capacity until June 1, 1925, when he became supervisor of track on the Pennsylvania



John H. Kelly

division, with headquarters at Clearfield, Pa. On October 1, 1927, Mr. Kelly was promoted to division engineer of the Rochester division, with headquarters at Rochester, N. Y., later serving in the same capacity on the River division, with headquarters at Weehawken, N. J., the Eastern division, at New York, and the Electric division, also at New York. He was holding the latter position at the time of his recent promotion to engineer of track.

Mr. Wilcox was born on September 2, 1892, at Parishville, N. Y., and graduated in civil engineering from Clarkson college. He entered railway service with the New York Central on January 8, 1917, as a chainman at Oswego, N. Y., later serving at the same point as a rodman and transitman. On September 22, 1925, he was promoted to assistant supervisor of track, with headquarters at Batavia, N. Y. On July 1, 1935, he was appointed assistant division engineer at Jersey Shore, Pa., and on November 1, 1937, he became supervisor of track at Clearfield, Pa. Mr. Wilcox was transferred to Batavia on August 1, 1940, where



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ROADMASTERS' CONVENTION

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CHICAGO
SEPTEMBER 14-17, 1942

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The Exhibit opens at Noon, on Monday, September 14, for the benefit of Railway Men who wish to come early to make an unhurried intensive study of the display. It closes on Thursday afternoon.

SEE! See the many interesting exhibits of products of proven merit . . . products that improve track . . . that reduce maintenance labor and costs. Learn how these products can help solve some of your toughest problems resulting from the unprecedentedly heavy war traffic, from increased wages, from the existing scarcity of labor and metals.

HEAR! Hear the interesting discussions, committee reports, suggestions and ideas of well-known railroad men, relating to vital matters connected with your everyday work. Ties and their renewals, drainage requirements and problems and other essential maintenance work will be thoroughly gone into and many helpful suggestions are sure to be offered.



**HOTEL
SHERMAN**

TRACK SUPPLY ASSOCIATION

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Chicago, Illinois

he remained until his recent appointment as division engineer at Watertown.

C. H. Hardwick, district maintenance engineer on the Chicago, Rock Island & Pacific at Kansas City, Mo., has been promoted to engineer maintenance of way, with headquarters at Chicago, and **S. T. Robertson**, engineer-roadmaster of the Burlington-Rock Island, with headquarters at Houston, Tex., has been promoted to district maintenance engineer, of the Rock Island, at Kansas City, succeeding Mr. Hardwick. **Belshur Bristow**, roadmaster at Ft. Worth, Tex., has been appointed engineer-roadmaster of the B-R. I. at Houston, replacing Mr. Robertson. **A. B. Harrison**, roadmaster at Iowa City, Iowa, has been promoted to acting district maintenance engineer at Des Moines, Iowa, relieving **Tom W. Brown**, who has been granted a leave of absence because of illness.

Edward H. Lewis, whose promotion to division engineer on the Illinois Central, with headquarters at McComb, Miss., was reported in the July issue, was born at Richmond, Ky., on September 30, 1887, and graduated in civil engineering from the University of Kentucky in June, 1910. He entered railway service on August 29, 1910, as a chairman on the Illinois Central, later serving as rodman, instrumentman and assistant engineer in the maintenance, construction and valuation departments at various points on the system. During World War I, Mr. Lewis served in the U. S. Army from January 26, 1918, to April 21, 1919, and saw service in France. He returned to the Illinois Central and was appointed assistant engineer



Edward H. Lewis

on the Louisiana division in June, 1921. On May 20, 1925, he was promoted to supervisor of track at Jackson, Miss., which position he held until his recent promotion.

William C. Perkins, district engineer of the South-Central district of the Union Pacific with headquarters at Salt Lake City, Utah, has been promoted to assistant maintenance engineer for the system, with headquarters at Omaha, Neb. **N. C. Pearson**, district engineer, with headquarters at Portland, Ore., has been appointed division engineer with the same headquarters. **L. V. Chausse**, division engineer at Portland, has been transferred to

Pocatello, Idaho, to succeed **L. F. Racine**, who has been transferred to Salt Lake City, Utah. **L. W. Althof**, district engineer at Omaha, has been appointed division engineer at Spokane, Wash.

Mr. Perkins was born at Soldier, Idaho, on December 20, 1888, and studied civil



William C. Perkins

engineering at the University of Idaho. He entered railway service on September 21, 1916, in the engineering department of the Oregon Short Line (part of the Union Pacific), with headquarters at Pocatello, Idaho. In the following year he enlisted with the Twenty-third Engineers and served overseas. Following the war he returned to railroad service with the Union Pacific as assistant roadmaster on the Montana division, where he was later promoted to roadmaster. Subsequently he was advanced to division engineer of the same division, then being transferred to the Utah division. On August 18, 1931, Mr. Perkins was appointed roadmaster of the Utah division, and on May 25, 1932, he was advanced to division engineer of the Kansas division. From January 1, 1933, to August 10, 1934, he served as roadmaster and general roadmaster on the Oregon Short Line and late in 1934 he was reappointed division engineer of the Kansas division. On January 1, 1937, he was appointed district engineer at Salt Lake City, which position he held until his recent promotion.

Track

J. L. Desselle has been appointed roadmaster on the Gulf Coast Lines (Missouri Pacific) at Beaumont, Tex., succeeding **C. L. Stuckey**, whose appointment as assistant division engineer at De Quincy, La., is reported elsewhere in these columns.

Forney Clyde Cunningham, assistant cost engineer on the Chesapeake & Ohio, has been promoted to supervisor of track at St. Albans, W. Va., succeeding **Gilbert David Mayor**, whose promotion to assistant division engineer at Huntington, W. Va., is reported elsewhere in these columns.

A. T. Wilkinson, assistant roadmaster on the New York, Chicago & St. Louis (Nickel Plate) at Cleveland, Ohio, has been promoted to roadmaster, with headquarters at Ft. Wayne, Ind., succeeding

W. S. Fife, whose promotion to assistant division engineer at Ft. Wayne, is reported elsewhere in these columns.

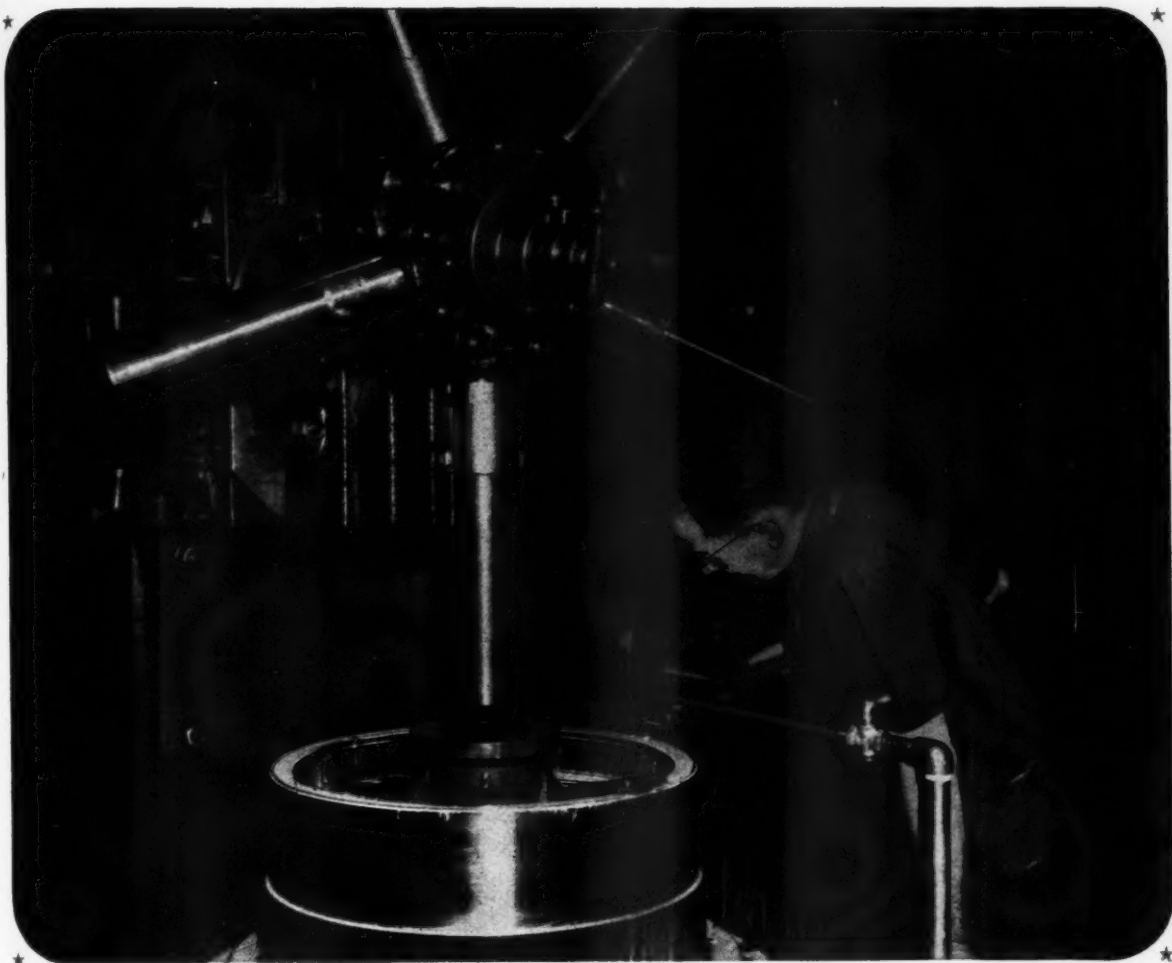
V. L. Jozwiak, roadmaster on the Ashland division of the Chicago & North Western at Clintonville, Wis., has been transferred to Green Bay, Wis., succeeding **Leo C. Smith**, whose appointment as engineer and supervisor of bridges and buildings at Mason City, Iowa, was reported in the July issue. **J. T. Peabody**, roadmaster at Antigo, Wis., has been transferred temporarily to Clintonville, replacing Mr. Jozwiak.

Walter Chaffee, assistant supervisor of track on the New York, New Haven & Hartford, with headquarters at New Rochelle, N.Y., has been promoted to supervisor of track at Danbury, Conn., a newly created position. **Vincent Gavigan**, assistant supervisor of track at Danbury, has been transferred to New Rochelle to succeed Mr. Chaffee. **Burton K. Heald**, assistant supervisor of track, with headquarters at Middleton, Conn., has been transferred to Waterbury, Conn., and **E. F. Coffey**, a gang foreman, has been promoted to assistant track supervisor at Middleton to succeed Mr. Heald.

G. M. Pickering has been appointed general roadmaster on the Union Pacific, with headquarters at Evanston, Wyo., a newly created position, with jurisdiction from Rawlins, Wyo., to Ogden, Utah. **J. E. Wise** has been appointed general roadmaster of the Los Angeles division, with headquarters at Los Angeles, Cal., succeeding **W. R. Keay**, who has been appointed roadmaster at Pocatello, Idaho. Mr. Keay replaces **H. G. Williams**, who has been transferred to Shoshone, Idaho, relieving **G. A. Sweet**, who has been appointed assistant roadmaster at Ontario, Ore. **P. T. Anderberg** has been appointed track specialist, Eastern district, with headquarters at Omaha, Neb.

Frederick C. Stapley, whose promotion to roadmaster on the Canadian Pacific, with headquarters at Prince Albert, Sask., was reported in the June issue, was born at Hastings, England, on February 20, 1891, and entered railway service on May 15, 1913, in the steam shovel department of the Canadian Pacific at Calgary, Alta. On May 1, 1914, he became a section man at Hughenden, Alta., and on March 2, 1918, he was advanced to section foreman at Hughenden, continuing at that point, with the exception of seasonal work as an extra gang foreman from 1925 to 1936, until May 20, 1941, when he was advanced to relieving roadmaster. Mr. Stapley's promotion to roadmaster was effective May 1.

C. S. Grimm, roadmaster on the Chicago, Rock Island & Pacific at Des Moines, Iowa, has been transferred to Iowa City, Iowa, succeeding **A. B. Harrison**, whose promotion to acting district maintenance engineer at Des Moines is reported elsewhere in these columns. **Lionie E. Snyder**, roadmaster at Sibley, Iowa, has been transferred to Des Moines, replacing Mr. Grimm, and **V. W. Reed**, inspector in the engineering department at Princeton, Mo., has been promoted to roadmaster at Sibley, relieving Mr. Snyder.



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FOR every machining job, there is a tool steel which will produce optimum results as regards the amount of work done per machine hour and per grind.

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the best *alternate* steel, for your protection in the event of possible future shortnesses in supply.



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der. **A. J. Winters**, extra gang foreman, has been advanced to roadmaster at Ft. Worth, Tex., succeeding **Belshur Bristow**, whose appointment as engineer-roadmaster of the Burlington-Rock Island at Houston, Tex., is reported elsewhere in these columns.

Mr. Snyder whose promotion to roadmaster at Sibley was reported in the July issue, was born at Midway, Tenn., on September 1, 1893, and entered railway service on July 19, 1910, as a section laborer on the Rock Island at Altoona, Iowa. On March 16, 1915, he was promoted to section foreman at Mitchellville, Iowa, and from January 2, 1928, to April 30, 1937, he served as section foreman at Altoona, except during the summers of 1928 and 1929, when he served as extra gang foreman on surfacing and rail laying work. On May 1, 1937, Mr. Snyder was promoted to track supervisor at Ottumwa, Iowa, later being transferred successively to West Des Moines, Iowa, Davenport and Montezuma. On October 15, 1938, he was transferred to Iowa City, where he remained until his recent promotion.

Clarence M. Gregg, assistant engineer on the Electric division of the New York Central, with headquarters at New York, has been promoted to supervisor of track of Subdivision 27 of the Pennsylvania division, with headquarters at Clearfield, Pa., to succeed **Russel L. Sahm**, who has been transferred to Subdivision 12 of the Buffalo division, with headquarters at Batavia, N.Y., to succeed **F. B. Wilcox**, whose promotion to division engineer is noted elsewhere in these columns. **Robert A. Bussing**, a transitman in the office of the division engineer of the Eastern division, with headquarters at New York, has been promoted to assistant supervisor of track of Subdivision six of the Mohawk division, with headquarters at Fonda, N.Y., to succeed **C. C. Lathey**, whose appointment as assistant engineer is noted elsewhere in these columns.

James Manson, whose promotion to roadmaster on the Canadian Pacific, with headquarters at Virden, Man., was reported in the June issue, was born at Thaiso, Scotland, on April 24, 1892, and entered railway service on May 1, 1911, as a section laborer on the Canadian Pacific in the Brandon (Man.) yard. On June 1, 1912, he was promoted to foreman of the Brandon division gravel pit and four months later he returned to Brandon yard as a section laborer. From September 1, 1913, to November 1, 1914, he served as a trainman on the Brandon division, then returning again to Brandon yard as a section laborer. On June 1, 1915, Mr. Manson was promoted to section foreman at Riverdale, Man., later being transferred successively to Lenore, Man., and Alexander, remaining at the latter point until his recent promotion, effective May 11.

Charles J. Morrell, whose appointment as roadmaster on the St. Johnsbury & Lake Champlain, with headquarters at Morrisville, Vt., was reported in the June issue was born on April 27, 1903, at Bethel, Vt. After a high school education, he attended the Huntington School, Boston, Mass., and Tufts College of Engineering. He entered railway service on the Central Vermont in the summer of

1918 as an extra gang laborer, and worked in that capacity during subsequent school vacations until 1924, when he was appointed assistant extra gang foreman on the Northern division. In April, 1926, he was promoted to section foreman at Middlesex, Vt., returning to the Northern division as an extra gang foreman in November, 1927. Mr. Morrell was appointed extra gang and work train foreman in July, 1937, holding this position until his appointment as roadmaster on the St. Johnsbury & Lake Champlain.

Bridge and Building

R. L. Mays, assistant division engineer on the New York, Chicago & St. Louis (Nickel Plate) at Ft. Wayne, Ind., has been appointed assistant supervisor of bridges and buildings on the Clover Leaf district, with headquarters at Frankfort, Ind.

P. E. Strate, master carpenter on the Chicago, Rock Island & Pacific at Rock Island, Ill., has been promoted to district bridge supervisor at El Reno, Okla., succeeding **H. G. Dennis**, who has entered military service. **J. L. Byrnes**, bridge and building foreman on the Panhandle division, has been advanced to master carpenter at Rock Island, relieving Mr. Strate.

J. A. Jorlett, assistant master carpenter on the New York division of the Pennsylvania, with headquarters at Jersey City, N.J., has been promoted to master carpenter of the Conemaugh division, with headquarters at Pittsburgh, Pa., effective July 1, to succeed **T. H. Gray**, whose appointment as assistant engineer is noted elsewhere in these columns. **N. I. Huntley, Jr.**, a draftsman in the office of the chief engineer of the New York zone at New York, has been appointed assistant master carpenter at Jersey City to succeed Mr. Jorlett.

Harold W. Jenkins, assistant bridge and building supervisor on the New York, New Haven & Hartford, with headquarters at Boston, Mass., has been promoted to bridge and building supervisor with the same headquarters to succeed **J. J. Wishart**, who has retired. **Benjamin J. Furniss**, general bridge and building foreman, has been promoted to assistant bridge and building supervisor at Boston, to succeed Mr. Jenkins. **E. L. Mortimer**, general bridge and building foreman at Providence, R.I., has been promoted to assistant bridge and building supervisor, with headquarters at Hartford, Conn., to succeed **J. A. Wishart**, who is off duty because of illness.

Hamilton M. Dick, whose promotion to master carpenter of the Toledo division of the Pennsylvania, with headquarters at Toledo, Ohio, was reported in the June issue, was born at Bowerston, Ohio, on July 21, 1894, and entered railway service on October 7, 1912, as a carpenter on the Panhandle division of the Pennsylvania. From May 26, 1917, to May 25, 1919, he was in the army, serving with the 15th U. S. Engineers in France, and on the latter date he returned to his former position on the Pennsylvania. On January 1, 1923, he was promoted to bridge inspector and on December 1, 1930, he was appointed

a carpenter foreman. Mr. Dick was advanced to assistant master carpenter on the Pittsburgh division on March 10, 1937, and on April 16, 1938, he returned to the Panhandle division as a carpenter foreman. He was again promoted to assistant master carpenter on the Pittsburgh division on September 18, 1939, which position he held until his recent promotion, effective April 9.

Thomas E. Jackson, whose promotion to general bridge and building supervisor of the Southern Pacific, with headquarters at San Francisco, Cal., was reported in the July issue of *Railway Engineering and Maintenance*, was born at Sterling City, Tex., on April 27, 1897, and entered railway service on August 1, 1918, as a bridge and building helper on the Atchison, Topeka & Santa Fe at Prescott, Ariz., later being promoted to carpenter and lead carpenter. In February, 1922, he was advanced to bridge inspector, with headquarters at Prescott, and in December, 1922, he was promoted bridge and building foreman at Winslow, Ariz. On November 10, 1924, Mr. Jackson went with the Southern Pacific as bridge and building foreman at Tuscon, Ariz., and on September 1, 1930, he was promoted to bridge inspector at that point. He was promoted to general foreman, with the same headquarters, on December 1, 1936, and on August 1, 1937, was advanced to acting supervisor of bridges and buildings, with headquarters at Tuscon, returning to the position of bridge and building inspector on January 31, 1938. Mr. Jackson was promoted to bridge and building supervisor, with headquarters at Tuscon, on December 16, 1938, which position he held until his recent promotion.

Obituary

Henry M. Baker, supervisor of bridges and buildings on the Missouri Pacific at Nevada, Mo., died suddenly at Cotter, Ark., on May 20.

E. C. Buhrer, supervisor of track on the New York Central at Sandusky, Ohio, died suddenly, apparently of a heart attack, near Vermillion, Ohio, on July 28.

Martin E. Rogers, who retired in 1914 as roadmaster on the Houston & Texas Central (now part of the Southern Pacific Lines in Texas and Louisiana) at Austin, Tex., after 50 years' railroad service, died in June at the age of 99.

Walter H. Norris, former bridge engineer of the Maine Central at Portland, Me., died in that city on July 11, at the age of 72. Mr. Norris served as bridge engineer of that road from 1910 to 1933, and as assistant engineer of structures from 1933 to 1936.

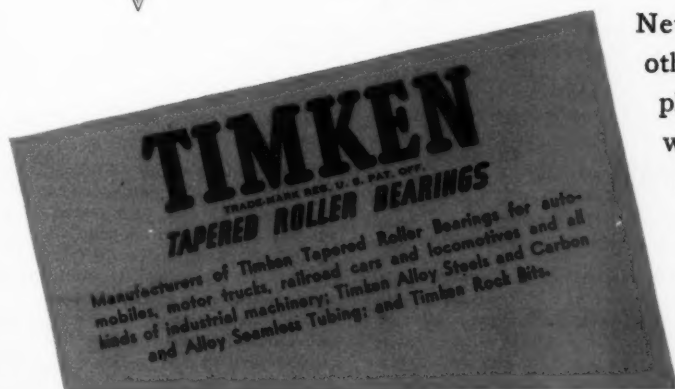
William Albert Roderick, engineer maintenance of way and structures of the Wheeling & Lake Erie, with headquarters at Brewster, Ohio, died suddenly at his home in Navarre, Ohio, on July 17. Mr. Roderick was born at Navarre, Ohio, on May 25, 1885, and studied several correspondence school courses. He entered railway service on September 1, 1905, as a timekeeper in the track department of the Wheeling & Lake Erie. In 1907 he

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**THE TIMKEN ROLLER BEARING
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was appointed construction foreman of the Sugar Creek & Northern (now part of the W. & L. E.) and from 1912 to 1921 he served as transitman, levelman and rail inspector in the engineering department of the W. & L. E. Mr. Roderick then served for a year as a transitman on construction work for the Ohio Power Company, returning to the W. & L. E. on March 15, 1922, as rail inspector. On



William Albert Roderick

October 16, 1922, he was promoted to assistant engineer and on April 1, 1924, he was appointed district roadmaster. He was promoted to engineer maintenance of way, with headquarters at Brewster, Ohio, in November, 1925, and a short time later was appointed engineer maintenance of way and structures, which position he held until his death.

Supply Trade News

General

The **Long-Bell Lumber Company** has purchased from the **American Lumber & Treating Company**, creosoting plants at Joplin, Mo., and DeRidder, La. These plants were built by the American Lumber & Treating Company in 1937 and have since been operated under contract by the Long-Bell Lumber Company for the creosote pressure treatment of the lumber company's product.

Personal

Dan C. Hungerford has resigned as vice-president and a director of the **Elastic Stop Nut Corporation**, Union, N.J.

L. E. Newell, chief experimental engineer of the **Jeffery Manufacturing Company**, Columbus, Ohio, has been appointed manager of engineering in charge of new designs of the Railroad division of the **Buda Company**, Harvey, Ill.

C. Granniss Bonner, formerly comptroller and more recently treasurer of the **Brunswick-Balke-Collender Company**, Chicago, has been elected treasurer of **Pomona Pump Company**, Pomona, Cal., succeeding to a portion of the duties of **Donald C. McKenna**, vice-president and

treasurer, who will devote full time to the production activities of the company's four manufacturing plants.

L. W. Brashares has been appointed manager of the Cincinnati district of the **American Rolling Mill Company**, Middletown, Ohio, and **E. D. Dronberger** has been appointed manager at Dayton, Ohio. **C. G. Farabee** has been appointed manager of the Chattanooga, Tenn., district, and **G. C. Wilson**, manager of the Middletown district, has been given a leave of absence because of ill health.

George E. Monroe has been elected president and general manager of the **Kalamazoo Railway Supply Co.**, Kalamazoo, Mich., succeeding **Frank E. McAllister**, who continues as chairman of the board, but who will confine himself largely to his personal interests. Mr. Monroe has been interested in the affairs of the **Kalamazoo Railway Supply Co.**, for some time, and is prominent in banking and industrial circles in the vicinity of Kalamazoo.

Murray M. Baker, of Peoria, Ill., has been appointed to the newly-created post of executive vice-president of **R. G. LeTourneau, Inc.** He will make his headquarters at the company's Peoria plant. The new post was created to enable **R. G. LeTourneau**, president, to devote a greater share of his time to the increased engineering activities made necessary by the company's war work. Mr. Baker has been a director of the company for the last four years.

Worthing H. Stone has been appointed assistant advertising manager of the **Timken Roller Bearing Company**, Canton, Ohio, in charge of advertising for the Railroad, Farm Implement, Automotive and Rock Bit divisions of the company. A graduate of Oberlin College, Mr. Stone became associated with Timken in 1936 as manager of the exhibit at the Great Lakes Exposition in Cleveland, Ohio, after which he became associated with the company's sales promotion work, specializing in the supplying of co-operative information to customers and to the general industry.

George Lowe has been appointed supervisor, new business research, of the **Carnegie-Illinois Steel Corporation**, Chicago, with the responsibility for coordinating the entire company effort to give vigorous effect to the further broadening and diversification of its business. Mr. Lowe was born in Chicago, on April 10, 1899, and graduated in civil engineering from Yale in 1921. Mr. Lowe's career includes early experience in construction, engineering, and reclamation work in central Illinois. He was subsequently executive vice-president of the **Albany Park National Bank & Trust Co.**, Chicago, and for the last eleven years he has been sole distributor for The Stanley Works for all exports and middle Atlantic states sales.

William T. Sanford has been appointed service manager of the Railroad division of the **Buda Company**, Harvey, Ill. Mr. Sanford attended Bates College, Lewiston, Maine, and went through the Chrysler Engineering school and the Hempville Diesel Engineering school. He served

six years with the **Hoosick Electric Specialty Company**, Hoosick Falls, N.Y., in developing and designing high dielectric molded material for magnetos, X-ray machines, aircraft ignitions, radios, etc.; 2½ years with the **Chrysler Corporation**, Detroit, as automotive and Diesel field engineer; two years with the **Sinclair Refining Company**, Chicago, as field engineer covering the state of Illinois; and three years with the **Socony-Vacuum Company**, Chicago, in the same capacity.

Obituary

John W. Braffett, retired general manager of sales of the **Oliver Iron & Steel Corporation**, Pittsburgh, Penna., died in Detroit, Mich., after more than a year's retirement because of poor health.

Robert D. Sinclair, a director of **Fairmont Railway Motors, Inc.**, Fairmont, Minn., and president of the company from 1928 to 1935, died at Ligonier, Ind., on July 2. Prior to 1928, Mr. Sinclair was president of **Mudge & Co.**, Chicago.

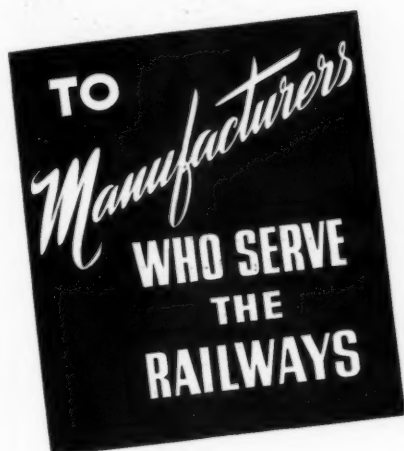
Emmett K. Conneely, manager of railroad sales of the **Republic Steel Corporation**, Cleveland, Ohio, died at the Eye and Ear hospital, Pittsburgh, Pa., on July 10. Mr. Conneely was born at Bolivar, N. Y., in 1884 and served in various capacities with the **Pittsburgh & Lake Erie** during his early business life, joining the **Standard Steel Car Company** at Baltimore, Md., in 1917. He was later connected with the **New York Air Brake Company** as vice-president and a director, and in 1925 he was made New York representative of the **Pullman Company**. He was subsequently made vice-president of the **Standard Steel Car Company** at Chicago, which position he held until March, 1933. In September, 1933, he went with the **Republic Steel Corporation** as manager of railroad sales.

Trade Publications

Oliver Gage Rods—The **Oliver Iron & Steel Corporation**, Pittsburgh, Pa., has issued a four-page illustrated folder describing its line of gage rods. The different types of gage rods manufactured by this company are listed and their functions and advantages are described.

Radial Air Compressors—The **Worthington Pump & Machinery Corporation**, Harrison, N. J., has issued an eight-page illustrated pamphlet, **Bulletin H-620-B16F**, which is devoted to its line of two-stage air-cooled radial air compressors. The characteristics of the different models in which these compressors are available are given, the salient features are described and tabulations of specifications are presented.

Buda Jacks—The **Buda Company**, Harvey, Ill., has published a 32-page pocket-size catalog, designated as bulletin No. 1066, which contains descriptions of and specifications on all types of Buda jacks. The catalog is well illustrated with photographs of each type of jack and, in addition, contains a table of contents and an explanation on how to select the correct jack to use, with a table showing at a glance the operating characteristics of each type of jack.



"It's an Electric Eye"

"Bill, the chief asked me this morning what I thought we should do about our advertising in *Railway Engineering and Maintenance* next year. He said the brass hats were going to have a meeting next week to start planning their program for '43," said the railway sales manager to his star salesman.

"What did you tell him?" replied the star salesman.

"I told him that I'd discuss it with him tomorrow. I wanted to get your opinion first for you're out on the firing line where you can see what it does."

"I'm glad you did that, Boss, for I *know* what it does for us. It's our 'electric eye'."

"Electric eye! What do you mean, Bill?"

"Just this, Boss—it opens a lot of doors for us before we get to them and saves a lot of time."

"You mean that these railway men feel acquainted with you and are ready to see you when you call?"

"That's it, Boss, they're not only ready, they're waiting."

"I wonder if that's true, Bill."

"Just ask Jim Smith of the A Company, Boss. He calls on a lot of the same people I do and his equipment does the same work as ours but only last week he told me that everywhere he goes these railway men ask him if his product's as good as ours. He says he's on the defensive all the time."

"That's a fine position for us to be in, Bill, but what's that got to do with our advertising?"

"Everything, Boss. Smith says *his* company claims it don't need to advertise—that its equipment's been on the market for years and everybody knows it."

"That sounds reasonable, Bill."

"Ask Smith, Boss. He'll tell you it isn't true. Too many new men are coming into the railway picture now—and he says a lot of the old ones forget him between calls, too."

"What's his solution?"

"What we're doing, Boss. He says we're smart to keep on advertising—wishes his company would give him the same help. He says our advertising *doubles* his sales resistance."

"Do you believe that's true, Bill?"

"I know it's true, Boss."

"In other words, Bill, you find that our advertising keeps us before our old customers and introduces us to the new men and thereby gives you the advantage over Jim Smith?"

"I'll say it does, Boss. It pays big dividends for us."

"I'm glad to have this report from you, Bill, for *you* see our advertising at work in the field. When I see the president tomorrow, I'm not only going to insist on the continuation of this advertising but I'm going to ask for more space next year."

**RAILWAY ENGINEERING AND MAINTENANCE IS
READ BY MAINTENANCE OFFICERS OF ALL RANKS**

I. B. CRANES ON THE JOB 99.4% OF THE TIME OPERATING ON LESS THAN 1.62 GALLONS OF FUEL OIL PER HOUR



INDUSTRIAL BROWNHOIST BUILDS BETTER CRANES

GENERAL OFFICES: DAY CITY, MICH. • DISTRICT OFFICES: NEW YORK, PHILADELPHIA, PITTSBURGH, CLEVELAND, CHICAGO

As an example of the efficiency of I.B. Cranes, take the case of one of America's largest steel companies who have been operating two 30-ton Industrial Brownhoist Diesel-powered Cranes. Their records reveal that these cranes have been down for repairs only .6 of 1% of their life-time. And as for fuel consumption, these same cranes have consumed on the average of only 1.62 gallons of fuel oil per hour.

Yet this is by no means an isolated case. I.B. Cranes all over the country have been chalking up similar—and even better—records for top-notch performance on the job.



BOOKS THAT HELP MAINTENANCE MEN TRACK AND TURNOUT ENGINEERING

By C. M. KURTZ, Formerly Track Engineer, Southern Pacific Company

This handbook for location, construction and maintenance of way engineers, transitmen and draftsmen, gives practical mathematical treatment of track layout and other problems. These are fully exemplified and worked out in detail, and illustrated with drawings of accepted designs for fixtures and track layouts. Contains original as well as a complete set of standard railway engineering handbook tables. All computing problems which may arise in track engineering are thoroughly treated.

457 pages, 116 illustrations, 33 tables, flexible binding, 5x7, \$5.00

ROADWAY AND TRACK

By W. F. RENCH

Packed full of practical information and written on a background of 25 years experience. Single track maintenance routine is described for each season.

Second Edition, 226 pages, 44 illustrations, cloth, 6x9, \$2.00

Simplified Curve and Switch Work

By W. F. RENCH,

Formerly Supervisor on the Pennsylvania

This little book has practically revolutionized curve and switch calculation practice since its appearance 15 years ago. The proved accuracy of its methods has caused them to be adopted as standard practice on many roads.

Complex algebraic and geometric calculations are reduced to their simplest form and as nearly as possible to terms of simple arithmetic. Application of these calculations to the actual job is made plain by brief explanation. Drawings further clarify the subject and make the meaning of the text unmistakable. Tables of dimensions are a further help to the track foreman.

Short cut formulae are featured. String lining and tape line layouts are fully explained. While retaining practically all of the rules and principles which have been tested in previous editions, changes have been made in several detailed features to correspond to improved designs. A flexible binding makes it handy to slip in the pocket.

Fourth Edition, 212 pages, 24 illustrations, 5x7, cloth, \$2.00

SIMMONS-BOARDMAN PUBLISHING CORP.
30 Church St., New York.

Please send me for 10 days' free examination the books checked below. I will either remit list price or return the books within that time.

☐ Simplified Curve and Switch Work ☐ Roadway and Track

☐ Track and Turnout Engineering

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City _____ State _____

Position _____ Company _____ RE&M 8-42

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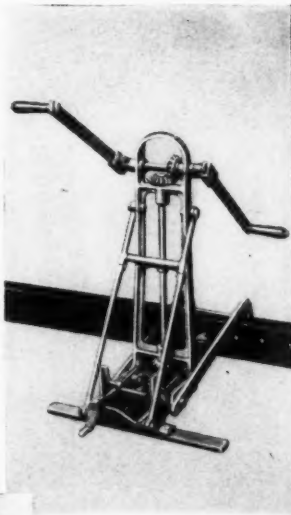
**Drill Rails
FASTER-
EASIER-
SAFER**



WITH **BUDA TRACK DRILLS**

Look at these outstanding features of Buda "Hyduty Paulus Track Drills:

- Easy to operate and carry—fast drilling.
- Safe—quickly removable from the rail.
- Four types of rail hooks available to meet all requirements.
- Special alloy malleable iron frame—gear pinions of forged steel, machine cut teeth.
- Bronze bushed bearings—handles adjustable to use various bits or feeds.



As illustrated at the left, two men can easily and rapidly operate the Buda "Hyduty" Paulus Track Drill . . . the curved frame top offers a convenient hand hold.

The view at the right shows how Buda Track Drills can be instantly folded back and away from rail on approach of trains, yet the drill bit remains in position and drilling may be resumed immediately.



Write for free literature on this and other Buda Maintenance of Way Equipment

THE BUDA CO.
HARVEY (Chicago Suburb) ILLINOIS

DEPEND
on BUDA for
Railway Equipment
and Supplies

SMALL GASOLINE MOTORS HELP MAINTAIN *Vital* COMMUNICATION LINES!

On the front lines, as well as behind the front, our country's war program depends a great deal on constantly keeping communications open. Here again, as in many other branches of military and civilian service, Briggs & Stratton 4-cycle, air-cooled gasoline motors ranging from 2/3 to 6 HP, play a vital role, furnishing dependable power for many uses.



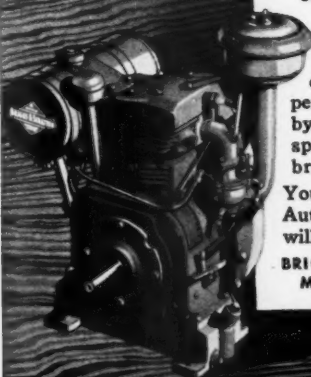
All the manpower and the production facilities of the Briggs & Stratton organization are now devoted to the war program.

To the hundreds of thousands of civilian users of Briggs & Stratton

motors we suggest that the life of the motors they now have can be prolonged—their performance kept at peak, by proper care and inspection and replacing broken or worn parts.

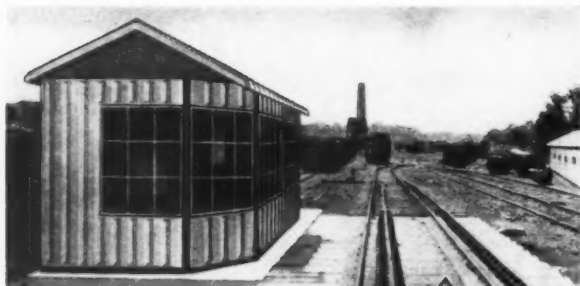
Your local dealer or an Authorized Service Station will serve and help you.

BRIGGS & STRATTON CORP.
Milwaukee, Wis., U. S. A.



BRIGGS & STRATTON

GASOLINE
MOTORS



Above—Butler freight car scale house.

Below—Butler motor track car and tool house.



BUTLER *Factory Fabricated* **STEEL BUILDINGS**

Speedily erected to house freight handling, materiel storage, warehousing, equipment repairing, machine shop and maintenance of way operations. Structurally strong, fire-safe, permanent, yet quickly taken down and re-erected, readily insulated, heated or air-conditioned. There are three helpful Butler Steel Building Books—one each on Butler industrial, Butler Boulevard and USS panelbult types.

Below—Butler 40' x 160' x 22' railway car repair shop which survived a tornado.



At right—Lined interior of steam-heated 90' x 200' x 22' Butler steel building housing fruit handling docks. (Below) Loading and unloading cars within these modern docks protects perishable foods against winter and summer extremes.



For prompt handling, address all inquiries to 1238 Eastern Ave., Kansas City, Mo., or 938 Sixth Ave., S.E., Minneapolis, Minn. Other sales offices: Washington, New York, Chicago, Atlanta, Shreveport and Houston.

Also representatives in other principal cities.

BUTLER MANUFACTURING COMPANY

FACTORIES:

KANSAS CITY, MO. . . . GALESBURG, ILL. . . . MINNEAPOLIS, MINN.

JUST PUBLISHED

TECHNICAL DATA ON PLYWOOD

**... the first 2 chapters of a
new engineering handbook
on Douglas Fir Plywood**

*Write for your free copy of this loose-leaf
data book now. Additional chapters will be
sent you as they are completed!*

● This engineering handbook contains data on the mechanical properties of Douglas Fir Plywood never before available to engineers and architects. You will find that this data makes Douglas Fir Plywood far more useful to you . . . that it will enable you to specify this "miracle wood" as a pinch hitter for unavailable materials, as a structural material and for countless purposes.

This handbook also contains the new U. S. Commercial Standards for Douglas Fir Plywood, CS45-42, established in cooperation with the National Bureau of Standards. It describes the revised types and grades of Douglas Fir Plywood in detail and tells how to use them.

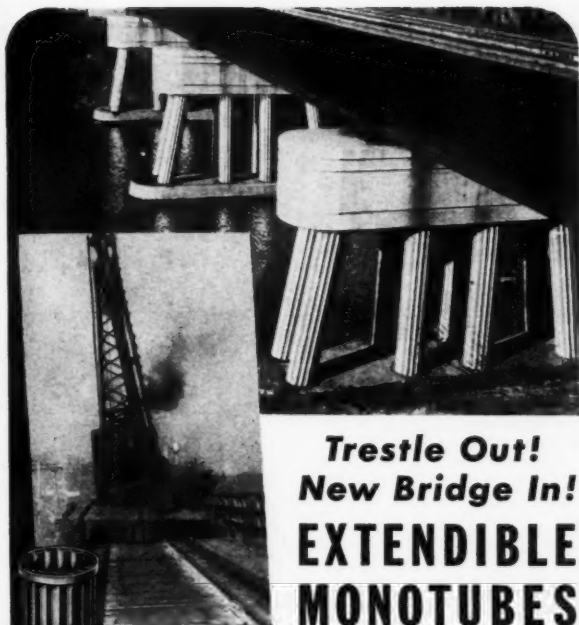
Write now for your free copy of "Technical Data on Plywood." It is in loose-leaf form, and you will be sent additional chapters as they are published. Douglas Fir Plywood Association, Tacoma, Washington.

DOUGLAS FIR PLYWOOD

Real Lumber
**MADE LARGER, LIGHTER
SPLIT-PROOF
STRONGER**

"A PRODUCT OF AMERICA'S ETERNALLY REPLENISHING FORESTS"

Railway Engineering and Maintenance



Trestle Out! New Bridge In! EXTENDIBLE MONOTUBES

SPEED PILING JOB *without* INTERRUPTION of TRAFFIC

● To replace an old timber trestle with a modern bridge doesn't sound like much. But to do it in the depth of winter *without* interrupting train traffic—that's a different story!

On this D. T. & I. Railroad job engineers turned the trick by using Union Metal *Extendible Monotubes* for the installation of cast-in-place concrete piles. A panel was removed from the trestle to permit driving of the main lower tapered section of each Monotube. The panel was replaced as a train approached, removed again after its passage and the necessary Monotube extensions added. Despite zero weather conditions, Monotubes for piers and abutments were driven in perfect alignment, even though half the piles were on an exceptionally intense batter.

Next time *you* have a piling problem, let Union Metal Monotubes supply the answer. Monotubes will speed the work, too, because of their *four* time-saving advantages . . .

1. **SPEEDY Handling.** Monotube steel casings are light in weight for fast, economical handling.
2. **SPEEDY Driving.** Tapered Monotubes require no core or mandrel and can be driven with any crawler crane equipped with standard leads and hammer.
3. **SPEEDY Extension.** Use of *Extendible Monotubes* permits installation of varying pile lengths on the job without delay or waste—permits quick installation even in low headroom.
4. **SPEEDY Inspection.** Hollow, tubular design enables you to inspect casing quickly and thoroughly from top to toe.

Monotubes can be supplied in a gauge, taper, and length to suit the requirements of any job. And our foundation engineers will work with you on request. Write for Catalog No. 68A!

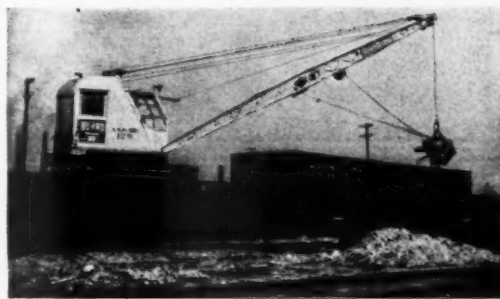
Design Engineers: D. T. & I. RAILROAD
F.W.KASTEN, Chief Engineer; J.S.HANCOCK, Bridge Engineer
Contractor: C. R. BOULTON, Columbus, Ohio

**THE UNION METAL
MANUFACTURING COMPANY**
Canton, Ohio



TERMINAL WORK

Here in busy yards in cramped space on the line, on sidings and on spurs BURRO cranes are twenty-four-hour-a-day work cranes. With clamshell, magnet or hook block, you can spot them under their own power, quickly. They travel up to 25 miles per hour and have a draw bar pull sufficient to haul from 10 to 12 empties. BURRO cranes really pay their way.



SUPPLY WORK

Low overall height in a crane has many advantages but none greater than flat car work in a supply train. The BURRO short tail swing is also important, and elevated boom heels which allow for comparatively short booms to reach over gondolas give BURRO cranes their wide operating range. BURRO cranes never ride the "cushions."



For Repair and Maintenance Men—Just off the press—new catalog of "C-F Positioners for faster, better and more economical welding." Write for your catalog today.

CULLEN-FRIESTEDT CO.,
1301 S. KILBOURN AVE. CHICAGO ILLINOIS



The Lundie Stepped, Non-Cutting, Non-Slip Base. Furnished in double or single shoulder.

LUNDIE TIE PLATES

The Lundie Tie Plate is designed with a stepped base which brings the wheel loads at right angles to the multiple bearing surfaces on the tie. It is economically designed giving maximum strength with minimum amount of metal affording a saving of scarce metal in this item of maintenance material.

THE LUNDIE ENGINEERING CORP.
19 WEST 50th ST., NEW YORK 59 E. VAN BUREN ST., CHICAGO

Classified Advertisements

Use this section when seeking a new man, a new position, or when buying or selling secondhand equipment.

CLASSIFIED ADVERTISEMENTS, \$10.00 an inch, one inch deep by three inches wide, an insertion.

EMPLOYMENT ADVERTISEMENTS, 10 cents a word a month, including address, minimum charge \$2.00.

Remittance must accompany each order.

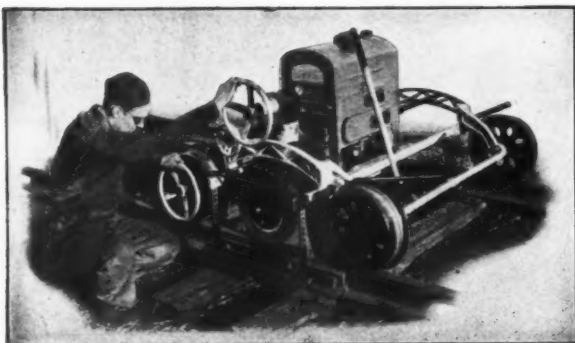
Railway Engineering and Maintenance
Classified Advertising Department
105 West Adams St., Chicago

Track Laborers. Large Crew. Best Experienced. Looking for Work Anywhere. High Reference.

Address: 646 Hegney Place, Bronx, New York.

MAKE RAIL ENDURE FOR "DURATION"

● More precious than gold, America's rail must be maintained as never before. On leading railroads, tons upon tons of rail are being saved by keeping Railway Track-work Grinders busy. These machines are helping to win the war. Many models to meet all requirements. Latest bulletins on request.



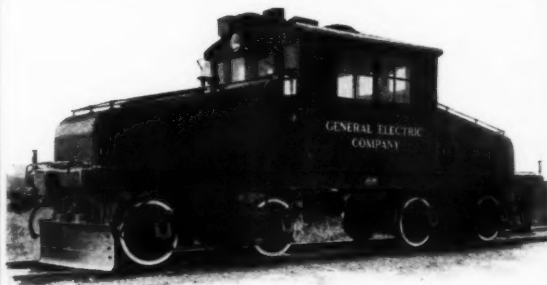
Railway Track-work Model P-6 track grinder—one of many models

Railway Track-work Co.
3132-48, East Thompson St., Philadelphia

2576



NEXT WINTER—BE READY with Q & C SNOW FLANGERS AND PLOWS



Q & C Snow Flangers are designed to fit your locomotives, whether Diesel Electric, Steam or Gasoline power.

Operated from the cab by air pressure, which forces them to the working position or raises them to clear obstructions.

Write now for information that will save you time and money this Winter and assure your lines being kept open for traffic.



THE Q & C COMPANY
Chicago New York St. Louis

AMERICA'S STURDIEST BABBITT METAL TAPES



LUFKIN "MICHIGAN" CHAIN TAPES

The extra tough steel lines are white metal coated and markings are deeply stamped into Babbitt Metal. You can't beat them for dependability and durability.

WRITE FOR FREE CATALOG

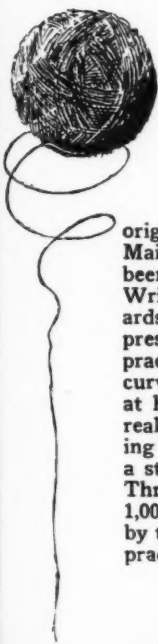
NEW YORK **THE LUFKIN RULE CO.** Canadian Factory
106 Lafayette St. SAGINAW, MICHIGAN WINDSOR, ONT.
TAPES - RULES - PRECISION TOOLS

NOW AVAILABLE

4th Edition

STRING LINING OF CURVES MADE EASY

By CHARLES H. BARTLETT



To meet the continuing demands for this booklet, reprinting a series of articles published originally in *Railway Engineering and Maintenance*, a fourth edition has just been printed and is now available. Written to meet today's exacting standards for curve maintenance, this booklet presents in detail a method of proven practicability for checking and correcting curve alignment readily with tools that are at hand. It makes possible the accurate realignment of curves without engineering instruments or other appliances than a string and a rule. Three editions of this booklet, each of 1,000 copies, have already been purchased by track men. Send for your copy of this practical aid for track maintenance.

Fifty Cents a Copy

Railway Engineering and Maintenance
105 W. ADAMS STREET CHICAGO, ILL.

Save Equipment



Help Win the War

Simplex Track Jacks have electrified gibs or rack bar slides so that wear is retarded, greatly increasing the service life of the jack and conserving vital metals. This metallurgical process increases the surface hardness of the gibs 250%—from the 130 Brinell hardness of ordinary malleable iron to 429 Brinell. That's why Simplex Track Jacks last so much longer. With the increased demands being made on track tools, you need these jacks.

Templeton, Kenly & Co.
Chicago

Cutting Maintenance-of-Way Costs Since 1899

Simplex
LEVER - SCREW - HYDRAULIC
Jacks

HOW TO MAKE YOUR MALL TOOLS

TRADE MARK

Last Longer and Work Better

FREE INSTRUCTION MANUALS are yours for the asking.

Write for your copies TODAY!

MALL Instruction Manuals complete with easy-to-understand diagrams and practical suggestions covering the operation and maintenance of MALL Tools are available for MALL Concrete Vibrators, Concrete Surfacers, Portable Electric MALL Saws and Drills, Door Mortisers, Door and Surface Planes, Flexible Shaft Grinders and Polishers, as well as Chain Saws.

In addition, factory-trained representatives in principal cities are waiting to service your tools. A minor adjustment today may save a major repair job tomorrow and conserve critical materials for War Production.



Write AT ONCE for your FREE copies of MALL Instruction Manuals giving the serial number of your MALL Tools. Name of MALL Service Base nearest you will be furnished upon request.

MALL TOOL COMPANY
7746 SOUTH CHICAGO AVE.
CHICAGO, ILLINOIS

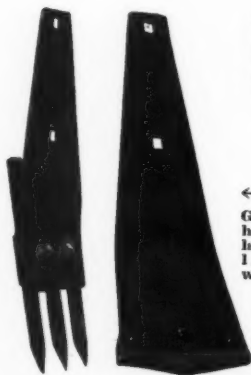


JACKSON Universal TAMPERS

The demand of War on rail transport is that "You get there fast with lots of it." To do that your track must be tamped in A-1 shape. Jackson Tampers, with interchangeable blades for all ballasts and conditions, do the job right, fast and at low cost.



← **U-606**
Gravel or Rock Blade, 6" wide, 3/4" tip, for tamping ballast not more than 1" in size, crushed slag or gravel.



U-607 →
Pick Tamping Blade, deeply penetrating teeth prevent angular materials from locking and arching before voids under ties are filled.

← **U-600**
Gravel Blade for high lifts, all ballasts; for low lifts in light ballasts, 9" wide with 3/4" tip.



1-2A Step-Cut Blade →
Best general purpose tamping tool. Adapted for use in all ballasts, in any lift of track. Spear-like point penetrates quickly and "steps" rather ballast and solidly tamp to fill every void beneath tie.

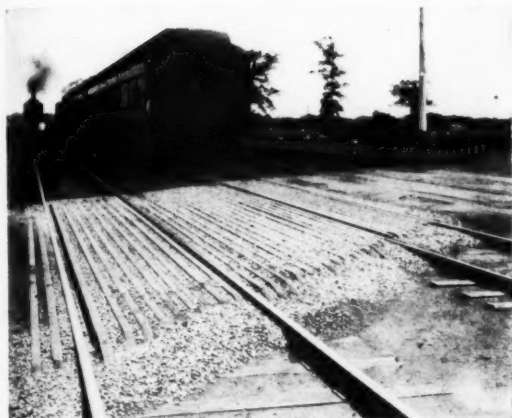
If you haven't received our new maintenance booklet we will be glad to send you one.

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON, MICHIGAN

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SHIP THAT SCRAP TO BLAST THE JAP!



★ ★ ★ Materials for Victory ★ ★ ★

★ **YOUR COUNTRY NEEDS** every available ton of ★
 ★ scrap. The Army and the Navy need 4,000 track ★
 ★ miles of relay rail at once. The steel mills *must* have ★
 ★ scrap to continue an uninterrupted flow of *matériel* ★
 ★ so urgently needed on every front.

★ Scores of old rail-type highway crossings have gone ★
★ to war. The average double track crossing yields from ★
★ 18 to 20 tons of high grade steel scrap or relay rail. ★
★ Check over those steel crossings of yours today. ★

★ **SHIP THAT SCRAP TO BLAST THE JAP** ★
★ **AND THE AXIS . . .** and for maintenance-free ★
★ satisfaction specify **MOSS READY-MADE** ★
★ **CROSSINGS FOR REPLACEMENTS.** ★

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★



A Smooth-Riding Crossing That's as Sturdy as The Track

Moss Ready-Made Crossings

THERE are no priorities on Moss Ready-Made Crossings. Designed and fabricated in accordance with the latest engineering developments, they are furnished in convenient, lightweight sections ready to fit in place.

Mass Crossings are made of *Black Gum*, carefully seasoned, completely pre-framed and thoroughly creosoted. *Black Gum* withstands the abrasion, impact and wheel loads of to-day's highway traffic better than any other domestic species of wood.

Small gangs can install them quickly *without* spe-

cial tools . . . no need to detour highway traffic . . . easy to remove if track work ever is necessary, the light-weight sections can be reinstalled without delay and can be salvaged for use elsewhere in the event of crossing elimination.

After eleven years continuous service without maintenance expense Moss Crossings are just as smooth and just as firmly in place as the day they were laid . . . and under some of the densest and heaviest truck-traffic in the country.

Write us for descriptive circular

The Stamp of Character

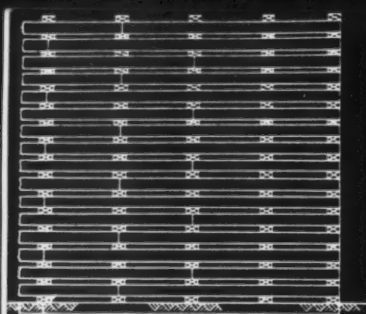
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MC

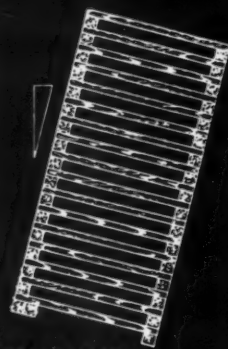
T. J. MOSS TIE COMPANY

SECURITY BUILDING

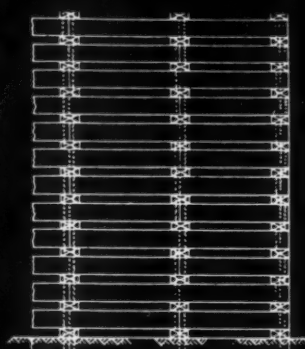
ST. LOUIS, MO.



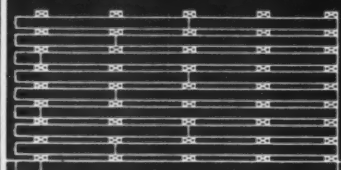
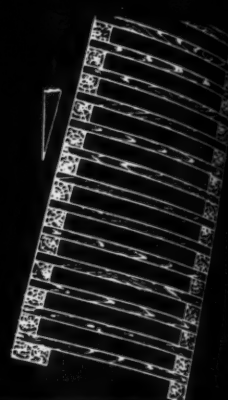
ELEVATION



CROSS SECTION



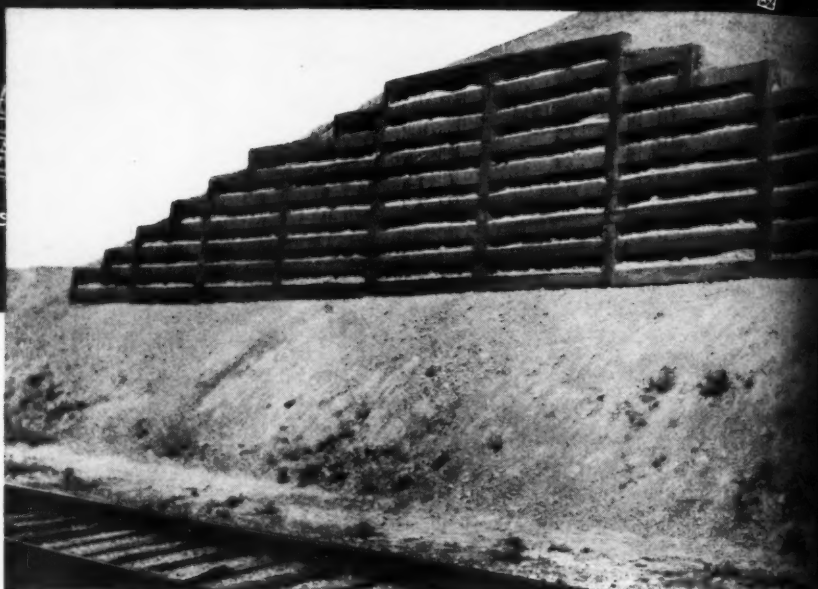
ELEVATION



ELEVATION



CROSS



Making a **SHORTER** bridge do the job with **PRESSURE-CREOSOTED CRIBBING**

Short-cuts and savings take on *extra* importance today . . . and pressure-creosoted cribbing helped to make them here.

Flattening the head-of-bank to a safe angle of repose would have meant moving hundreds of cubic yards of

material . . . and demanded a considerable increase in bridge span. A low-cost retaining wall of pressure-creosoted cribbing made all this unnecessary.

Many railroads and highway departments are utilizing this safe, simple, economical and *permanent* method of reducing labor and material requirements in constructing overpasses, preventing encroachment of embankments on adjoining property, holding toe of fill along highways, and similar jobs.

Pressure-creosoted cribbing can be framed to your specification, prior to

pressure-creosoting. Assembly can be handled with local labor, and minimum equipment. Sectional construction can be used, with excavated material (where suitable) utilized for backfill. The completed structure is ready for use immediately; no shoring or back-work to be removed. Should future changes become necessary, material can be salvaged. Pressure-creosoting gives dependable protection against decay and termite attack.

On *your* retaining wall jobs . . . it is profitable to check up on what pressure-creosoted cribbing can do.

**WOOD PRESERVING DIVISION
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